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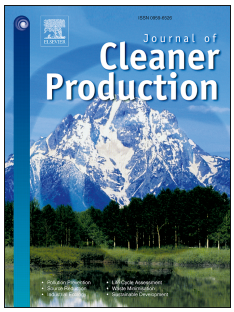


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# Evaluation of environmental impacts in the catering sector: The case of pasta

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## Abstract

Despite its enormous size and economic value, there is currently scant information on environmental impacts from the catering sector. At the same time, the awareness of and preferences for environmentally sustainable food preparation and consumption are growing. In general, two catering approaches are practiced: cook-serve and deferred. In the former, food is cooked and immediately served to consumers while the latter allows for the food to be prepared at times and places completely different from consumption. This study, based in Italy, focuses on environmental impacts of deferred catering with the aim of evaluating different options for food preparation and distribution, to help identify environmentally sustainable solutions. For these purposes, the case of pasta, one of the most popular foods worldwide, is considered. Two main types of deferred system (cook-warm and cook-chill) and cooking technologies (pasta cookers and range tops) used in the catering sector are evaluated. The results suggest that cooking in pasta cookers saves up to 60% of energy and 38% of water compared to range tops and therefore reduces by 34-66% the impacts associated with pasta preparation. The environmental impacts of pasta cooking could also be reduced by using gas rather than electric appliances as the impacts of the latter are higher by 13-98%. In the current study, pasta cooking is the major hotspot in both the cook-chill and cook-warm chains. Overall, the impacts from the cook-chill chain are 17-96% higher than from the cook-warm system, mainly because of the use of refrigerants and higher consumption of energy.

*Keywords: catering sector; cook-warm chain; cook-chill chain; food preparation; environmental impacts; life cycle assessment*

## 1. Introduction

Catering is a complex system involving both people and equipment in the preparation and serving of food. Such systems transform a diverse combination of inputs into desired outputs (Smith and West, 2003). A commonly accepted definition of the term “catering” or “food service” is “the provision of food and beverages away from home*”* (Davis *et al.* 1998). Traditionally, catering has been divided into the “cost food service sector” or “contract catering”, which, broadly speaking, refers to not-for-profit catering activities, and the “profit sector” (Smith and West, 2003). The former includes catering outlets for business, education and health care, while the latter comprises profit-orientated establishments such as restaurants, fast-food chain outlets, cafes, takeaways, pubs, leisure and travel catering outlets (Bourlakis and Weightman, 2004).

In general, two catering approaches are practiced: conventional or cook-serve and deferred (Ciappellano, 2009). In the former, food is cooked and immediately served to consumers with all stages of food preparation occurring in a few hours before the food is served and consumed. This is typically the case in restaurants and canteens. The deferred system, on the other hand, allows for the food to be prepared at times and places completely separate from consumption: here, the food preparation and cooking are carried out in centralised kitchens, from which the prepared meals are distributed to consumers (e.g. hospitals, schools, companies, etc.). The time difference between the preparation in the catering centre and the consumption can be several hours, days or even months, depending on the method used to preserve the food. Three main types of deferred system can be distinguished: the cook-warm, cook-chill and cook-freeze chains (Williams,1996;