

Increasing Sustainability in the German Bakery Trade: Reducing Bakery Returns and Improving Sales Performance by Using Forecasting Order Optimization Software

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Abstract

In Germany, the bakery trade comprises 9,607 businesses with total sales of 16.27 billion Euros (Zentralverband des Deutschen Bäckerhandwerks e.V., 2023). Bread and bakery goods are the second most frequently consumed foodstuff in Germany (Statista, 2023a). In total, 4.7 million tonnes of bakery goods are produced annually in Germany, of which 1.7 million tonnes are wasted. The return of unsold bakery products accounts for 36% of the total waste amount, being the second largest cause after households (49%) (Schmidt et al., 2019). Hence, at the value chain intersection between production and sale of bakery products lies a great potential for the reduction of bakery returns and its associated resources.

Reducing bakery returns is not only reasonable from an ecological and ethical point of view. Additionally economic benefits can be achieved, which is especially interesting for bakeries as production cost have strongly increased, e.g. grain prices increased by 54,7% worldwide in the past year (2022) compared to the index baseline of 2014-2016 (Statista, 2023b). Forecasting order optimization software (FOOS) in the bakery trade sector helps to prognose future sales of individual bakery products within each single bakery store. The prediction is based on historical and ongoing data from the ERP system and also considers other influencing factors, e.g. weather and public holidays. Based on the predicted sales data for each bakery store, the quantities ordered from the central production site can be optimised. The objective of such software is to avoid sell-outs, to serve the customers the products they ask for and simultaneously reduce the quantities of returned bakery products, which are otherwise left unsold at closing time. The software-driven approach helps to digitalise the bakery trade, mitigates bakery returns and provides valuable field data, accelerating food waste quantification as part of international and national sustainability targets such as SDG 12.3.

This field study has three objectives: Firstly, to extend the current knowledge about the amount of bakery returns in Germany. Secondly, to analyse the potential influence of a FOOS on food waste reduction; this quantitative data on the bakery returns is obtained

before and after using the FOOS in three participating bakeries with a total of 33 bakery stores. Product categories such as bread and rolls, snacks, pastries and cakes are considered. Thirdly, to reveal chances and barriers regarding the implementation and usage of FOOS in the bakery trade. The latter qualitative data is obtained by a focus group interview with the management of the respective bakeries.

At the time the abstract was prepared, the results to be presented at the Retaste conference 2023 were still being analysed. The results will comprise the absolute (in kg/year) and the relative (in %) returned quantities before and after the usage of the FOOS for each given bakery product category and in total for the respective bakeries. In addition, the monetary effect for the bakeries is also determined.

Keywords: Food waste, bakery returns, digitalization, intelligent software, forecasting tools, bakery trade, return rate, food waste reduction potential

References

- Schmidt, T. G., Baumgardt, S., Blumenthal, A., Burdick, B., Borowka, J., Claupein, E., Dirksmeyer, W., Hafner, G., Klockgether, K., Koch, F., Leverenz, D., Lörchner, M., Ludwig-Ohm, S., Niepagenkemper, L., Owusu-Sekyere, K., & Waskow, F. (2019). Wege zur Reduzierung von Lebensmittelabfällen - Pathways to reduce food waste (REFOWAS): Maßnahmen, Bewertungsrahmen und Analysewerkzeuge sowie zukunftsfähige Ansätze für einen nachhaltigen Umgang mit Lebensmitteln unter Einbindung sozio-ökologischer Innovationen, [Volume 1, Thünen Report 73]. Braunschweig. Statista. (2023a, May 2). Konsumierte Lebensmittel in Deutschland 2022 | Statista.
<https://de-statista-com.ezproxy.fh-muenster.de/prognosen/999889/deutschland-regelmaessig-konsumierte-lebensmittel> Statista. (2023b, May 2). Getreide: Jährliche Preisentwicklung weltweit bis 2022.
<https://de.statista.com/statistik/daten/studie/1237384/umfrage/jaehrlicher-preisindex-getreide-weltweit/> Zentralverband des Deutschen Bäckerhandwerks e.V. (2023, May 2). Bäckerhandwerk in Deutschland: Strukturzahlen 2015 bis 2022.
<https://www.baeckerhandwerk.de/baeckerhandwerk/zahlen-fakten/>

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