



Food safety and food waste in one Portuguese public hospital

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Introduction



- Is estimated that each year, one third of all food produced ends up rotting in the bins of consumers and retailers or spoiling due to poor transportation and harvesting practices.
- Indeed food waste (FW) is connected with SDG12 “Responsible Production and Consumption”, and the evaluation of FW was a first step for its management.
- The FW was already become an object of discussion of the hospital food service, since it is seen as the cause of health, economic, social and environmental negative impacts.
- The hospital's food service is a key piece in patient care, being crucial for patient treatment and recovery.
- From the food preparation to the distribution the hospital's food service must always provide safe food and within the defined standards about nutritional quality and adequacy, palatability and temperature.

Material and Methods

2.1 Meals production

- FW of meals served at lunch was evaluated for all new patients admitted in the paediatric, medicine, oncology and orthopaedic wards. Samples were collected from the light diet, and from the soft texture.

2.2 Microbiological and physicochemical analysis

- Enumeration and detection of *Listeria monocytogenes*, *Salmonella* spp. and *Staphylococcus aureus*, and enumeration of *Clostridium perfringens*, *Bacillus cereus*, *Escherichia coli*, Enterobacteriaceae and total viable counts (TVC) at 30°C were performed according ISO procedures.
- The aW was measured in a Rotronic Hygroskop-DT apparatus with a WA40 probe at 25° C. The pH determination was performed, in duplicate, directly into samples, with a WTW 330i pH meter. The moisture content and ashes were determined according to ISO-1442 and ISO-936. The determination of total nitrogen was carried out using the Kjeldhal method according to AOAC 981.10.

2.3 Food waste analysis

- The FW of the dish was calculated by the physical method by weighing the meal plate carrying out the assessment before and after the distribution of the trays, following the procedures of the European Commission Standard methodology approved in 2019. For the soup, the visual estimation method was used.

2.4 Statistical analysis

- The analyses were carried out using the statistical software IBM SPSS STATISTICS Version 20. To compare means of two independent samples, non-parametric tests were used.

Results and Discussion

- Regarding the percentage of protein per meal, both light (8.73%) and soft (3.33%) diets presented in average values lower than those recommended by the WHO (10-15% protein). The value of different microorganisms varied along the production moments, however the final products in light diet (after hot regeneration) presented 1.34-1.73 log ufc/g of TVC. Counts of *Bacillus cereus* and *Staphylococcus aureus* were also obtained at low levels (less than 1 log ufc/g). Besides these results, the risk of foodborne diseases should be considered.
- The FW (%) of the light diet (n=64) was 39.8 ± 6.3 in dish and 14.9 ± 5.4 in soup and of the soft texture diet (n=51) was 65.1 ± 9.0 in dish and 39.0 ± 5.8 in soup. The FW was significantly higher in soft texture diet (soup and dish), and this can be potentially explained by the fact that patients that usually are consumers of this type of diet are more debilitated, may have reduced appetite and many of them need help to eat autonomously.

Conclusion

- The data obtained in this study draws attention once again to the importance of the implementation of effective measures to increase food safety and reduce FW at hospital context.

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