

Small changes in choice architecture in a military lunchroom¹

Do they nudge towards healthier food choices?

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Summary

Nudging is a term that refers to a set of interventions which introduce simple changes to the design of the psychological, social and physical environment, to encourage people to make better decisions and change their behavior without coercion. As part of the introduction of occupational health management in the German Armed Forces, this study examined whether simple nudging measures increased the selection of healthy food and drink in the military canteen at Kaufbeuren Air Base. The results showed that, after the introduction of nudging measures, more diners chose salad as an accompaniment and fruit as a dessert and the proportion of water chosen from a range of free drinks increased.

Keywords: nudging, choice architecture, catering services, healthy choice, nutritional behavior

Methodology

Study design, data collection and analysis

A pretest–posttest design was adopted, as the selected military canteen has only one serving line.

Survey period 1: Before the introduction of various nudging measures, the number of each of the following elements served at lunchtimes was counted between 23 March and 17 April 2015: main and side dishes, side salads served at a salad counter, fresh fruit as dessert and choice of free drinks. The number of diners was counted by the number of transactions at the cash register.

Survey periods 2 and 3: After the introduction of the measures described below, the same serving data was recorded at the modified serving line between 15 June and 10 July 2015 (short-term) and between 14 September and 8 October 2015 (medium term).

Data collection was restricted to lunchtimes on Monday to Thursday, when more than 250 lunches are usually served. The menu was the same as in survey period 1 in all four weeks of survey period 2 and in three of the four weeks of survey period 3.

Introduction and objective

Nudging in food catering aims to change diners' selection of food without coercion or prohibition – in this case in favour of a healthier selection of food and drink. Nudging encompasses all interventions through which the characteristics or positioning of food and drink or related stimuli are altered. These

alterations are made in the serving area, where diners should choose a healthier selection. The alterations are usually not consciously perceived and processed; they influence the selection behaviour of multiple diners at the same time and are not tailored to specific individuals. The interventions are usually simple, can be made without loss in overall turnover and whilst retaining the freedom of choice [1–3].

As part of the research on occupational health management in the German Armed Forces, this study examined whether nudging measures encouraged the selection of healthy food and drink by diners in the short and medium term at a selected canteen (Kaufbeuren Air Base).

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¹ This article is a shortened version of Chapter 6.2 "Gesundheitsförderliche Speisenauswahl" (Healthy Food Selection) of the German Armed Forces' internal expert report entitled "Erprobungsvorhaben im Rahmen der Einführung eines BGM" (Trial Projects as Part of the Introduction of Occupational Health Management).

In all three periods, the study determined the proportion of diners who (a) selected the main element of a so-called “fitness menu” which has been offered daily for many years, (b) chose salad as an accompaniment and (c) chose fresh fruit as a dessert as well as (d) the proportion of water chosen from the drinks range. The results of survey period 2 and 3 (posttest phases: nudging measures implemented) were compared to data from survey period 1 (pretest phase) on a daily and weekly basis as well as over the entire period.

The difference in proportions was calculated and tested for equality by chi-square test. Eleven days featuring the same meals in each of the three survey periods were included in the comparison to rule out any effects of different menus.

Interventions

The following simple measures were implemented after repeated participative observation of the serving line and in consultation with canteen management:

- Components of the recommended fitness menu, the salad counter and the water dispenser on the drinks machine were marked “green” throughout.
- The recommended daily fitness menu was favorably presented on the displayed menu and on the info wall.
- The complete recommended fitness menu was exhibited alongside the entrance in a display case on a daily basis (♦ Figure 1).
- Pieces of fruit were offered as a dessert in addition to fresh sliced fruit. Sliced Fruit was presented in glasses and not in small bowls (♦ Figure 2).
- Mineral water was also offered in half-liter bottles in green containers in several places at the serving area (♦ Figure 3).

- Handling at the salad counter was simplified by means of attractive, white-green salad bowls with higher edges and dressing containers which were easier to reach and could be served with one hand.
- Posters on healthy food selection and posters with attractive fruit and vegetable images were placed alongside payment card machines, at the entrance door and in the dining room.
- A poster with information on the duration of sporting activity required to convert the energy from different drinks was positioned beside the drinks machine.

Results

On the eleven survey days, between 124 (survey period 1, Thursday of 1st week) and 335 (survey period 2, Wednesday of 3rd week) guests consumed lunch. In total, the evaluation was based on food selection data from 2,657 diners in survey period 1, 3,036 diners in survey period 2 and 2,824 diners in survey period 3.

After the introduction of the nudging measures, favorable changes in the selection of food and drink were apparent in the short and medium term. These results are illustrated in ♦ Figure 4. The number of diners increased marginally in total.

The proportion of diners who chose the main components of the **fitness menu** rose directly after the introduction of the measures by 4.0% ($p < 0.001$) from 25.8% to 29.8%. In the medium term, this increase fell back and was not significantly higher than the starting figure (+ 1.1%; $p = 0.34$). However, on days when the main components of the fitness menu had already proved very popular, increases of up to 15% were recorded.

The proportion of diners who chose **salad** as an accompaniment rose



Fig. 1: Fitness menu suggestion presented in a display case at the entrance



Fig. 2: Pieces of fruit and sliced fruit served in glasses as dessert



Fig. 3: Additional mineral water offered at several points in the serving area

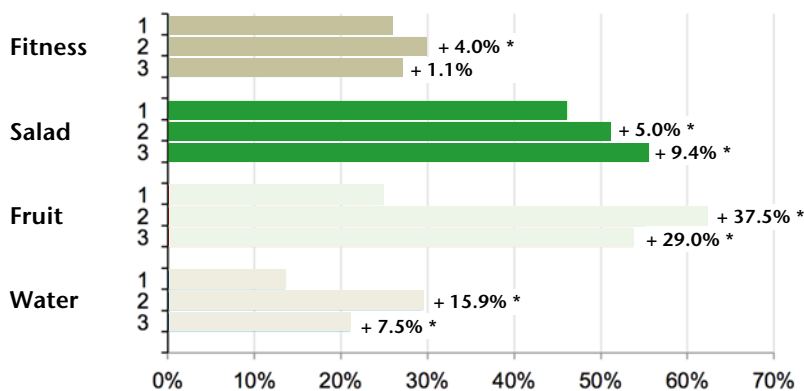


Fig. 4: Proportion of diners, who previously (1), in the short term (2) and in the medium term (3) after the introduction of nudging measures chose the fitness components, salad and fruit, as well as the proportion of water chosen from the drinks range with changes in comparison to the first period. * statistically significant

from 46.1% at the start to 51.1% in the short term (Δ 5.0%; $p < 0.001$) and to 55.5% (Δ 9.4%; $p < 0.001$) in the medium term. This increase was accompanied in the short term, but not in the medium term, by reduced selection of cooked vegetable elements.

The greatest effect appeared in the choice of **fresh fruit** as dessert. Before the introduction of the measures, only 24.7% of diners chose fruit. 62.2% of diners (Δ 37.5%; $p < 0.001$) chose fruit in the short term and 53.7% (Δ 29.0%; $p < 0.001$) in the medium term. In parallel to this increase, significantly fewer other desserts were chosen; however to a lesser effect. Fruit therefore partly substituted other desserts, but was also chosen in addition.

The proportion of **water** chosen from the drinks range increased from 13.5% at the start to 29.4% in the short term (Δ 15.9%; $p < 0.001$) and to 21.0% in the medium term (Δ 7.5%; $p < 0.001$). The proportion of soft drinks chosen reduced over the same time period – yet less significantly – so we can assume that there was at least some substitution of soft drinks.

Conclusion

To our knowledge, this was the first study in the German-speaking region into the effects of simple and inexpensive nudging measures to encourage healthier eating behavior at a worksite lunchroom.

A more varied selection of fruit (pieces of fruit and sliced fruit) and attractive containers with easy-to-grasp water bottles seem to have had a particularly favorable influence on selection, even in the medium term. Both are good examples of inexpensive and easy-to-implement measures.

The improvements in diners' selection behavior show that successful nudging measures in a catering service can be simple, inexpensive and easy to implement. Nudging in this context should be further explored in research and practice alongside traditional measures to modify behavior. However, the design and introduction of target-oriented measures adapted to respective canteen circumstances presuppose, in our experience, a precise analysis of the serving environment and close involvement and on-going motivation of catering professionals and kitchen personnel.

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Conflict of Interest

The authors declare no conflict of interest.

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