

THE INFLUENCE OF THE CUTLERY AND DISHES ON RESTAURANT FOOD TASTE EXPERIENCE

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Abstract

Purpose – The taste experience of a restaurant guest depends on a range of factors. One of the dominant elements in the feeling of pleasure is the quality of food. It depends on the taste, smell, colour, density, texture, and other properties of the meal which guests can perceive through their senses. However, well-designed quality cutlery and dishes used for serving food can affect one's taste experience, which ultimately results in a greater success a food-service establishment. Previous studies on the influence of tableware on the guest's taste experience have been focused on the size, ergonomic properties, heat conductivity, hardness of the material, and the like; however, there has not been enough concern with the influence of the weight and design of the dishes on the sensory experience of food.

Methodology – The ratings of every taste were grouped and a descriptive statistical data analysis was conducted: minimum (min.), maximum (max), coefficient of variation (CV), standard deviations measures (σ), mean value (\bar{x}). The results were sorted into corresponding tables, and some of them were displayed on a graph.

Findings – The results have shown that the weight which was distinctive for cups and spoons, i.e. the material they are made of and their design, significantly resulted in different experiences of certain sensory properties of the tasted food.

Contribution – Additionally, the results of this paper have their contribution to food-service industry by setting the goal of paying more attention to the design, weight, and quality of tableware items.

Keywords: weight, design, cutlery, dishes, restaurant food, guest's taste experience

INTRODUCTION

The quality of the cutlery and dishes affects the taste experience of food in a food-service establishment. The type and the quality of the tableware used for serving to guests depends on the type of the establishment.

Well-designed quality cutlery and dishes used for serving food affect one's taste experience of the food, which ultimately leads to guests' satisfaction and more successful food-service establishments.

The aim of this paper is to explore the influence of the weight and design of the cutlery and dishes used for serving food on the guest's experience of restaurant food. The weight itself depends on the type and structure of the material the items are made of. Its

quality is often linked with a high price, which is justified, because it directly reflects the increased guest satisfaction.

Previous studies have been focused on the size, ergonomic properties, heat conductivity, hardness of the material, and the like, yet they have not shown enough concern with the influence of the weight (in kilograms) and design of the cutlery and dishes on the sensory experience of food.

Design can be defined as a multidisciplinary process that requires the ability to materialize predefined intentions and expectations into new design solutions. Ideally, good design should improve the user's experience (Buchanan 1989). Previous studies have indicated that the strength of taste experience and the consumer's perception are affected by the shape of tableware items – their size, height, and corners (Arnheim 1974; Van Rompay, Hekkert, Muller 2005; Van Rompay, Hekkert, Saakes et al. 2005; Zhang et al. 2006). Becker et al. (2011) note that the rounded corners are perceived by the consumers as much safer than the sharp during consumption.

The food industry experts increasingly stress the importance of food containers (packing material) and their contents. It has been proven that the packaging or container attributes (e.g., the sounds it makes, its smell, feel, shape, and/or colour) will affect subsequent taste experiences and product appraisals, but not only due to physical interactions, but also as a result of crossmodal associations and/or perceptual illusions (Becker et al. 2011).

The weight of the items, in this particular research, the cutlery and dishes, can leave different taste experiences. According to Lindstrom (2005), in many product categories, there is a clear association between heaviness, quality, and expense of the product.

In social behavioural research, Ackerman et al. (2010) have demonstrated that holding heavy or light clipboards non-consciously influenced participants' taste experience of job candidates they were evaluating.

The scope of this paper is restaurant food, cutlery and dishes of different weight, design, and material.

The aim of the study was to explore how weight and design of the cutlery and dishes, in which the dish is served, affects consumer's perception and experience of restaurant food, and it is conditioned by the quality of the material from which it is built. Well-designed high-quality cutlery and dishes in which food is served, influences the impressions about the food, which eventually contributes to the efficient business management of the catering facility. Reaching the established goal will result in the conclusions about the significance of the appropriate choice of cutlery and dishes for the guest's taste experience.

1. RESEARCH METHODS

The paper uses the following ISO standards quality assurance: SRPS ENISO 8586 – 2, EN ISO 8589 и ISO 6658 (Popov,Raljić 2013). For the purposes of the experiment, the researcher had been provided with the following:

- research location;
- participants;
- appropriate evaluation sheets;
- product for evaluation;
- auxiliary items – serving inventory of different quality and design.

The research follows the model of the research by Piqueras-Fizman, Betina et al., made in 2011, with certain modifications in the realisation.

The experiment was realised in a experimental kitchen, with artificial daylight type of lighting, at the room temperature varying between 22 and 24°C, and with the appropriate air flow.

Thirty partially trained food tasters participated in the experiment; no information about the specific aim of the study had been provided at the recruitment stage. All the participants had medical certificates proving that their senses of smell and taste were not impaired.

The age of the participants ranged between 20 and 30 years, 21 participants were female and 9 were male. The procedures were explained to all participants in detail prior to their participation in the experiment.

The evaluation sheets had the list of six product properties, which were numerically rated using a seven-point Likert scale. The participants rated the following conditions:

- first impression;
- colour;
- smell;
- density;
- taste;
- general impression.

For each condition, the participants were instructed in the procedure of filling in the scales, using the paper-and-pencil method during the tasting. The sheets also included written instructions, phrased as: “Please pick up the bowl with one hand and try a spoonful. Rate the entire experience according to your own perception”.

1.1. Quality ratings of yoghurt consumed from different bowls

In the first part of the experiment, the participants had the task of evaluating samples from three bowls:

- a light bowl (L)
- a medium-weight bowl (M)
- a heavy bowl (H)

All the bowls differed in weight, material, and design.

The participants were not informed that the contents of the bowls were identical in all the three cases.

The bowls used for the experiment had the following properties (Image 1):

- the L bowl was made of white ceramic (15.5 cm in diameter, 200 g);
- the M bowl was made of fine porcelain (15.5 cm in diameter, 210 g);
- the H bowl was made of white ceramic, with a thicker bottom and the logo of the Department for Geography, Tourism and Hotel Management (15.5 cm in diameter, 260 g).

Image 1: **The first part of the experiment**



Photographed by: Authors

1.2. Quality ratings of yoghurt consumed with different spoons

The second part of the experiment involved three identical 250 g bowls and three spoons of different weight and design. The spoons had the following properties (Image 2):

- a decorative spoon, 40g in weight;
- an edged spoon, 52 g in weight;
- a regular broad spoon, 63 g in weight.

Image 2: The spoon used in the second part of the experiment



Photographed by: Authors

For the purposes of the experiment, 150 ml of yoghurt were served in each bowl:

- for the first part of the experiment: the same yoghurt from the “Meggle” dairy, Kragujevac, 2.8% of milk fat;
- for the second part of the experiment: the same yoghurt for every tasting – from the “Zdravo” dairy, Subotica, 2.8% of milk fat;

The course of the experiment was the following:

- the experimenter places a bowl and a metallic spoon on a table in front of each participant;
- the previous bowl was taken away before the next one was presented;
- the participants were instructed to hold the bowl with one hand and the spoon with the other (the one they usually used for writing), and to hold each bowl in the same way during the experiment;
- they could taste as much as one spoonful during each evaluation;
- filtered natural water and water crackers were available for rinsing between tastings for taste neutralisation.

1.3. Statistical data analysis

The ratings of every taste were grouped and a descriptive statistical data analysis was conducted:

minimum (min.);
maximum (max);
coefficient of variation (CV);
standard deviations measures (σ);
mean value (\bar{X})

The results were sorted into corresponding tables, and some of them were displayed on a graph.

2. RESULTS AND DISCUSSION

2.1. Analysis of the sensory quality ratings of yoghurt in different bowls

In the course of experiment, while serving the same product in the bowls that differed in weight, quality, and material, the mean value (\bar{x}) was considered the most credible piece of data for a more detailed data analysis.

The following three tables show the data obtained for the conditions rated after tasting the same product from different bowls (Tables 1, 2, and 3).

Table 1: The results of the rated properties of the yoghurt tasted from the 200 g bowl

	Min	Max	Standard deviation (σ)	Coefficient of variation(CV)	Mean value(\bar{x})
First impressions	2	6	1.26	27.50%	4.60
Color	4	7	1.16	20.34%	5.70
Smell	3	7	1.58	35.14%	4.50
Density	3	7	1.34	28.46%	4.70
Taste	3	7	1.52	29.88%	5.10
General impressions	3	7	1.45	29.57%	4.90

Table 2: The results of the rated properties of the yoghurt tasted from the 210 g bowl

	Min	Max	Standar deviation (σ)	Coefficient of variation(CV)	Mean value(\bar{x})
First impressions	4	7	1.17	20.96%	5.60
Colour	3	7	1.16	20.34%	5.70
Smell	3	7	1.40	26.89%	5.20
Destinaty	4	7	1.25	23.62%	5.30
Taste	2	7	1.56	31.27%	5.00
General impressions	4	7	1.16	21.88%	5.30

Table 3: The results of the rated properties of the yoghurt tasted from the 260 g bowl

	Min	Max	Standard deviatin (σ)	Coefficient of variation(CV)	Mean value (\bar{x})
First impression	3	7	1.34	23.46%	5.70
Colour	4	7	0.92	15.84%	5.80
Smell	3	7	1.63	32.66%	5.00
Destinity	3	7	1.40	24.11%	5.80
Taste	3	7	1.34	25.24%	5.30
General impressions	3	7	1.43	26.07%	5.50

The table 4 shows the mean value of the conditions rated for the product tasted from three different bowls which comprise the three samples. The yoghurt that made the best first impression, thus receiving highest median ratings by the consumers, was the one from the third sample, which was tasted from the heaviest bowl, with the mean value of 5.70. The other conditions rated for this bowl got highest ratings as well: the colour and density got the rating of 5.80, the taste got 5.30, while the median rating for the general impression was 5.50. Therefore, all the conditions of quality, as well as the mean value of the conditions for the yoghurt from the heaviest bowl got highest ratings, with the exception of the smell (5.00).

Although it was one and the same yoghurt, yet served in a lighter bowl, which weighed 210 g, the evaluators' ratings for the sample 2 were lower, so it was placed second. The first impression got the rating of 5.60, the colour got 5.70, the smell got 5.20, the density got 5.30, and the general impression got 5.30.

The lowest-rated yoghurt was the one in the lightest bowl, which weighed 200 g. The first impression got the rating of 4.60, the colour got 5.70, the smell got 4.50, the density got 4.70, and the taste got 5.10. The general impression was 4.90.

Table 4: Mean values of the sensory ratings of yoghurt from different bowls

	200 g bowl	210 g bowl	260 g bowl
First impression	4.60	5.60	5.70
Colour	5.70	5.70	5.80
Smell	4.50	5.20	5.00
Density	4.70	5.30	5.80
Taste	5.10	5.00	5.30
General impression	4.90	5.30	5.50

Taking into account the fact that every participant tasted the same product, this research shows that the dishes the food was served in have a multisensory effect. They exert a significant effect on our enjoyment of food and on our perception of its value (Michel et al. 2015). A recent study (Harrar and Spence 2013) has confirmed that the aesthetic properties of the cutlery and dishes can affect the consumer's perception. The study has shown that the weight of the dish the food is consumed from could affect the consumer's perception of the food (Harrar and Spence 2013; Spence and Piqueras-Fiszman 2012b; Piqueras-Fiszman et al. 2011; Piqueras-Fiszman and Spence 2012a). The properties of the cutlery and dishes that transfer to the impression of the food are known as "sensation transference" (Krishna, Morrin 2008). Other authors have described this property as the "halo effect" (Spence, Piqueras-Fiszman 2014; Cheskin 1957; Lawless, Heymann 1997).

2.2. Analysis of the sensory quality ratings of yoghurt consumed with different spoons

In the second part of the experiment the consumers used the spoons of different weight, material, and design. In the course of the experiment with the different spoons, upon observing the data obtained (shown in the Tables 5, 6, and 7 and in graph 1), it can be concluded that the highest median rating was not with the product consumed with the heaviest spoon, but with the spoon of medium weight with different silver details. The heaviest spoon was a regular spoon for everyday use, yet the product consumed with the spoon was placed second by the consumers, before the third spoon, which was the lightest. This confirms that, despite the fact that the spoon was ordinary, its weight ranked the consumed product better than the product consumed with the smallest spoon. Most certainly, its design was the reason why the ratings were not the highest for the product.

The analysis of the results of the highest-rated product consumed with the spoon 2 is presented in Graph 1, which shows that all the mean values of this product categories received highest ratings. Therefore, the first impression has the mean value of 5.90, the colour - 6.00, the smell - 5.80, the density – 6.10, and the general impression has the mean value of 6.00.

The data indicate that the design of the medium-weight spoon (52 g), with the noticeable silver edges, had the greatest influence on the consumers perception. The spoon was neither the lightest, nor the heaviest, but it had a different design, so the consumed product got highest median ratings. It should be reemphasised that it was one and the same product served with different spoons.

Table 5: The results of the rated properties of the yoghurt tasted with the 40 g decorative spoon

	Min	Max	Standard deviation (σ)	Coefficient of variation (CV)	Mean value (\bar{X})
First impression	3	7	1.69	35.14%	4.80
Colour	3	7	1.49	26.22 %	5.70
Smell	4	7	1.18	21.43 %	5.50
Density	3	7	1.55	29.79 %	5.20
Taste	1	7	2.11	42.16 %	5.00
General impression	3	7	1.34	25.24 %	5.30

Table 6: The results of the rated properties of the yoghurt tasted with the 52 g edged spoon

	Min	Max	Standard deviation (σ)	Coefficient of variation (CV)	Mean value (\bar{X})
First impression	4	7	1.10	18.65%	5.90
Colour	4	7	1.05	17.57%	6.00
Smell	4	7	1.23	21.19%	5.80
Density	5	7	0.99	16.30%	6.10
Taste	5	7	0.99	16.85%	5.90
General impression	5	7	0.94	15.71%	6.00

Table 7: The results of the rated properties of the yoghurt tasted with the 63 g ordinary spoon

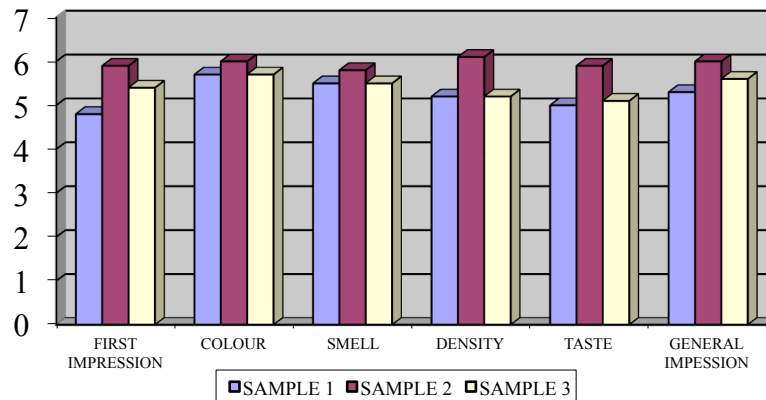
	Min	Max	Standard deviation (σ)	Coefficient of variation (CV)	Mean value (\bar{X})
First impressions	3	7	1.51	27.88%	5.40
Colour	4	7	1.25	21.96%	5.70
Smell	3	7	1.65	30.00%	5.50
Destinaty	2	7	2.04	39.31%	5.20
Taste	2	7	1.79	35.14%	5.10
General impression	3	7	1.71	30.58%	5.60

The lowest mean value is with the product consumed with the spoon 1, where the first impression has the median rating of 4.80, while the rating for the general impression is 5.30. The results indicate that, apart from the weight, the design can also significantly affect the consumer's perception. The results of this experiment show that the nicest spoon, i.e. the spoon with the best design, got highest median ratings.

The available literature also indicates that the material properties of the cutlery (in the form of metal) can affect the perception of the intensity of particular tastes present in food (Piqueras-Fiszman et al. 2012a; Laughlin et al. 2011). The visual aspect of the cutlery appears to be as an important variable which changed/improved the consumer's perception (Laughlin et al. 2011).

The Graph 1 clearly shows better ratings for the second sample.

Graph 1: **A graphic display of the mean value of the quality ratings for the yoghurt consumed with different spoons**



The important differences in the ratings of the food observed by modifying the type of cutlery (differing in look and feel, with a significant difference in weight) suggest that the overall positive (or negative) values attributed to the cutlery implicitly modify the perceived enjoyment of the food (Michel et al. 2015).

3. CONCLUSIONS

Based on the conducted research of the influence of the cutlery and dishes on restaurant food taste experience, the following conclusions were made.

The product served in different dishes and consumed with different types of cutlery was rated differently, although it was one and the same product that was tasted.

The highest rankings were for the product consumed from the heaviest bowl, which confirmed that the weight of the dish, and the material the dish is made of affects the guest's taste experience.

Upon consuming the same product with spoons of different weight and design, the highest ratings were for the product consumed with the medium-weight spoon of special design, which confirmed that besides the weight, the design also significantly affects the guest taste experience.

This research confirmed that the dishes the food is consumed from have a multisensory effect. They significantly affect the enjoyment of food and the perception of its value. The aesthetic properties of the dish and the cutlery also affect the consumer's impression. The research showed that the weight of the dish the food is served in

affects the consumer's perception. The properties of the dish and cutlery transfer to the impression of the food.

The results of the research can contribute to food-service industry, implying that more attention should be paid to the presented topic. It is necessary to find the optimal design, quality, and weight of the dishes and cutlery. This paper has also shown that the weight of the bowls significantly affected the guest's taste experience, while the second part of the experiment indicated that the weight is secondary in importance to the design. The research undoubtedly confirmed that the appropriate cutlery and dishes affect the taste experience and the very hedonic response of the consumer.

ACKNOWLEDGEMENTS

This paper is part of the research projects III-46009 and III-46005 financed by the Ministry of Science and Technological Development of the Republic of Serbia.

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