

Article

Less Salt, Same Taste: Food Marketing Strategies via Healthier Products

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Abstract: Given the negative effects deriving from the overconsumption of sodium chloride (salt), this paper aims to verify whether food companies can provide their products in a healthier version, without modifying their organoleptic characteristics, specifically studying how it is possible to reduce salt in food without affecting taste. From an empirical point of view, a sensorial analysis was organized. A panel of volunteers were invited to taste some samples of pizza crust which had been prepared using different quantities of salt. Each individual assessed the amount of salt they perceived on a graduated scale. These samples were prepared by reducing the amount of salt by 7%, 10%, 16%, 23%, 30%, and 53%, respectively. The reference point used was the average content of sodium chloride in five popular brands of pizza dough in Italy. Panelists' evaluations revealed that a 10% reduction in sodium chloride was imperceptible from the point of view of taste. Considering the negative consequences deriving from salt overconsumption, this study shows how food companies can contribute to achieve the UN Sustainable Development Goals by investing more attention in public health.

Keywords: salt; SGDs; health; food marketing; consumers

1. Introduction

One of the objectives contemplated by the United Nations 2030 Agenda for sustainable development is related to good health and well-being in particular, as specified in the UN website, to “reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being”. Moreover, it is strictly linked to another objective, so called “zero hunger”, which establishes that “by 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round”. The relationship between a proper diet and a good health is evident [1,2], and food companies could play an important role from this point of view. It is sufficient to think about industrial food production, which is sometimes blamed for using unhealthy ingredients or excessive amounts of other ones, especially sugar and salt. To this end, the World Health Organization has suggested limiting the daily intake of sugar to less than 10% of total energy intake, and salt (sodium chloride) to less than 5 g per day [3]. This information is particularly relevant considering the excessive quantities of these ingredients in some popular foods and beverages; it is sufficient to think about the high levels of sugar in fizzy drinks as well as the copious amounts of salt in fast food. The negative consequences on health of a diet based on a high intake of salt or sugar have been scientifically demonstrated, and this raises many doubts on the industrial food market.

Their presence definitely impacts on taste and, consequently, on the preferences of consumers. According to [4], high amounts of salt, sugar, and/or fats could create addiction, and this would explain their excessive use.

What kind of role could the consumer have in influencing food companies to change these controversial practices?

To this end, this study is aimed at exploring how food companies could improve their products by basing their marketing strategy on food quality, strengthening their own image.

In particular, here, the researchers analyze at what point a reduction of salt in food might be imperceptible to taste and, consequently, benefit consumer health. In other words, this research represents a new perspective in the analysis of salty food; it emphasizes the role of consumers and their preferences, essential to drive food companies to provide healthier products. This is particularly important to explore because processed food is sometimes accused of being wholesome, and companies create product lines with specific brands for more attentive consumers even though this food could be considered less tasty [5]. From this point of view, this research has the aim to study if companies can compete on providing healthier food without generating hesitation by consumers. Companies should consider to analyze the way to make healthiness an important variable for food selection, but this means not to change its main organoleptic characteristics. Is it possible? Companies should consider that for two main reasons: (1) contributing to public health, (2) improving their image/reputation by showing more sensitivity to their consumers' health. In this perspective this study analyzes if it is possible, through an experimental design with a panel of consumers. The researchers selected pizza dough to test it because it is a popular product in Italy, as it is the homeland of pizza, and it is simple to reproduce. Moreover, this choice was inspired by the fact that pizza has the highest content of salt among some takeaway foods analyzed in the UK by [6] and also because it is consumed worldwide. The case of Italy is particularly relevant because the typical local diet is the Mediterranean one, recognized by the UNESCO as cultural heritage and known for its health benefits [7] so that it is plausible to expect sensitivity to healthy nutrition issues from Italian consumers.

Inspired by [8] and considering that bread and pizza crust are both baked flour products, the hypothesis of this research study is:

H1: Food companies could apply a marketing strategy based on food quality, by reducing salt of up to about 10% (as shown by [9]), and this will not change the organoleptic perception of pizza dough.

In particular, the study of [8] was divided into two phases: during the second one, participants had to evaluate five samples of bread, characterized by different amount of salt; findings of their research revealed that the sodium content of bread could be reduced through a cumulative series of small salt reductions without affecting consumer hedonic perception.

2. Why Food Companies Should Consider to Reduce Salt

Sodium Chloride (NaCl) is the chemical name for cooking salt [10], a chemical combination of 40% sodium and 60% chloride. Sometimes sodium and salt are used synonymously, however, this is not totally correct. Salt is the source of about 90% of sodium in the human diet and is essential for the maintenance of cellular membrane potential and the absorption of nutrients in the small intestine [11]. Despite this, it has been scientifically demonstrated that an excessive intake of salt can cause health problems, such as high blood pressure [12–14], cardiovascular diseases [15–18], stomach cancer, kidney stones, osteoporosis, and kidney disease (He and MacGregor, 2010). Salt intake, furthermore, seems to contribute indirectly to obesity, because of its effects on soft drinks consumption [19], since research showed that salt reduction generates a decrease in fluid consumption [20].

Considering these negative effects, the World Health Organization recommends consuming a maximum of 2 g/day of sodium, which corresponds to 5 g/day of salt for adults [3]. To this end, a healthy diet is fundamental. However, despite these recommendations, foods high in salt are purchased daily and consumed worldwide. Reference [21] analyzed the salt content in seven popular fast food chains

in Costa Rica, observing that the highest content in salt was registered in two chains, specifically, 1.57 g per 100 g of products. Reference [22] studied the case of the United States, highlighting a high presence of salt in 69 (of 125) commercially processed and restaurant foods. Similarly, Reference [23] analyzed 30,073 menu items in 237 restaurant chains, revealing a high sodium density, 2.196 g/1000 Kcal on average (1.865 g when including children's menus), exceeding the limits recommended by U.S. Department of Agriculture (1.5 g/day). Reference [24] highlighted that in the US, 80% of toddlers (aged 1 to 3) consume an excessive quantity of sodium and this could be doubly harmful considering the odds of protracting this negative food habit for their lifetime. Reference [25] presented data on Korea which revealed that, on average, Korean adults consume 42,934 g sodium per day, twice the WHO recommendations. The situation is not dissimilar in poorer countries, such as Benin. In fact [26], in a study involving 420 participants (aged 25–64), observed an overconsumption of salt, in particular among those who live in urban areas, who are younger than 44 years old, have an administrative employment, a high income, a Body Mass Index (BMI) ≥ 25 kg/m², and a large waist circumference. According to the [27], the excessive salt intake of Europeans is also high at 7–18 g per day. A study by [28] in Northern Ireland, which has one of the highest rates of coronary heart disease and stroke in the United Kingdom, found that the habitual intake of processed foods leads to overconsumption of sodium chloride. The trend does not change also in Australia: from the results of a questionnaire administered in Melbourne (n = 474), Reference [29] found that salt consumption exceeds the suggested limits, in particular in young people and consumers of Asian origin.

According to [30], it is possible to undertake political initiatives to reduce salt intake; firstly, these should be introduced through a series of communication campaigns to increase awareness of the problems of overconsumption; secondly, a phase of agreements with industries should be aimed at establishing standards to lower sodium levels in processed foods; a third phase should monitor consumers salt intake by means of surveys, followed by regulation. Reference [31] made an overview of salt reduction initiatives around the world, highlighting the absence of strategies in most African and Asian countries. Partial reduction of salt levels in foods was achieved in some countries such as Brazil, Argentina, Chile, USA, Canada, Spain, Italy, and Australia, while a concrete reduction was registered in a few nations such as the UK, Ireland, Iceland, Finland, China, and Japan. Some of the initiatives implemented include reformulation of products, establishment of sodium content targets for foods, consumer education, front-of-pack labelling schemes, taxation on high-salt foods, and interventions in public institutions. Some scholars have studied the case of the United Kingdom as it represents a successful example [32–34], in particular, underline that the campaign organized by the UK Food Standards Agency contributed to reducing salt intake by about 10% during the period 2003–2007, even if in the previous period initiatives had been undertaken to lower the salt quantity in food [35] because of the effects of a high-salt diet on health. For example, according to [36], salt reduction would mean lowering the incidence of stroke by 22% and that of ischemic heart disease by 16%; moreover, reducing salt in processed foods would have benefits on blood pressure levels and at least 75,000 deaths per year would be prevented in Britain.

Consumer Behavior and Salt Consumption

Even though the salt consumption issue has been analyzed more deeply by nutrition and medicine researchers, there are some studies focused on consumer behavior. Reference [37] explored consumer knowledge on salt intake. Four hundred and ninety-three shoppers were involved in a survey and most of them did not recognize the relationship between salt and sodium and were not able to understand the information about salt on the label, however, they did show some knowledge about the negative consequences of a highly salty diet on blood pressure. Reference [38] analyzed the question of salt reduction (from 0 to 8.4 g/100 g of flour) on the structure and qualitative characteristics of a specific product, i.e., puff pastry (prepared both in a full-fat and in a reduced-fat version). They demonstrated that different quantities of NaCl effectively led to changes in the characteristics of the pastry. As a matter of fact, increasing salt levels produced less firmness in the full-fat pastry and a superior specific

volume and lift at both fat levels; from a sensorial point of view, moreover, a reduction of 30% did not affect consumer appreciation, even if it was perceived in terms of taste and texture.

An experiment organized by [39] tested how much a sample of consumers liked five different foods (cooked sausage, chorizo, dry sausage, cheese, muffin), presented in two different versions. The first version was a commercial product, the second one was prepared reducing quantities of salt, fat, and sugars in order to verify if any differences could be perceived. Findings revealed an unbalanced situation: commercial cooked sausages were the preferred version, in cheese and muffins the reduction did not influence their enjoyment, while dry sausages were even favored in the healthier version. Reference [40] tested how a gradual salt reduction in bread could be perceived by consumers. These researchers found that a salt reduction of up to 52% did not compromise consumption: this changed when NaCl was reduced by 67% and less bread was consumed. Similarly, Reference [41] found that a salt reduction of 25% in bread does not affect consumers' acceptance of this product. These are particularly interesting findings for the food industry.

Anyway, despite some research shedding light on consumer behavior implications, it is evident that marketing literature is limited with regards to salt consumption. This issue, as a matter of fact, is analyzed only indirectly from a marketing perspective and mostly research is published in nutrition-focused journals (or medical and chemical ones). From this point of view, this manuscript is a first effort to study this problem under the marketing lens, also by considering the scarce presence of studies focused on the Italian case in order to cover this clear gap in scientific literature. The recent debate on public health (due above all to Covid-19 emergency) underlines the necessity to pay more attention to health issues, and food marketing could contribute to this (Reference [42] underline the role of marketing in the improvement of public health).

This research is aimed at verifying how companies can provide healthier food, with a focus on pizza dough. An interesting study was carried out by [9], who explored by how much the quantity of salt in pizza dough had to be reduced before consumers noticed any change in the taste. As scientific literature also points out [43,44], this would bring considerable health benefits to people in industrialized countries where the overly frantic lifestyle is a cause of the decrease in the consumption of homemade food in favor of takeaway. In this study, we have partially replicated the research design applied by [9] in order to verify if salt reduction is perceived in a similar way in Italy, the pizza homeland, where consumers are particularly demanding about its organoleptic properties. According to [9], a reduction of up to 25% does not alter the salty taste, even though in their case they added potassium chloride (KCl), which is a NaCl substitute. On the contrary, in our study, no salt substitute was added, and the analysis was based only on the reduction of NaCl. Why is it necessary to replicate a study to a different country? Should Italians be different from Germans? The answer may be explained by Hofstede's cultural dimensions theory [45], which refers to cross-cultural communication by considering six variables (Power Distance Index, Collectivism vs. Individualism, Uncertainty Avoidance Index, Femininity vs. Masculinity, Short-Term vs. Long-Term Orientation, Restraint vs. Indulgence), which can highlight cross-cultural differences among countries, which may have a deep impact on international marketing strategies. It is evident, therefore, that studying two different countries could shed light on important differences also in terms of marketing. It is not unusual, for example, to find marketing studies on cross-cultural bases [46–49].

Finally, researchers were inspired by a recent study by [8] that focused on bread and the possibility of reducing its salt content by 10% without consequences on consumer sensorial perceptions, thus highlighting the potentialities of gradual salt reduction in order to lower the sodium content in food.

3. Method

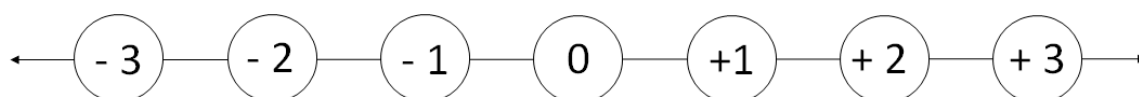
The first step of our study was focused on the analysis of the characteristics of five popular brands of pizza dough in Italy: Buitoni (owned by Nestlè), Rana, Coop, Valle Fiorita, and C.R.M. In order to have a complete overview, their average nutrition facts are presented in the following table (Table 1).

Table 1. Average nutrition facts.

	Buitoni (280 g)	Rana (260 g)	Coop (385 g)	Vallefiorita (460 g)	C.R.M. (420 g)
	100 g	100 g	100 g	100 g	100 g
Energy	1117 kJ/265 kcal	1173 kJ/278 kcal	1133 kJ/268 kcal	1300 kJ/309 kcal	1286 kJ/306 kcal
Total Fat:	6.8 g	7.4 g	5.2 g	7.6 g	9.6 g
Saturated fat	2.3 g	3.0 g	0.7 g	2.9 g	3.7 g
Carbohydrate:	42 g	43.1 g	46.7 g	46.7 g	45.9 g
Sugars	0.2 g	1.1 g	1.8 g	1.1 g	1.1 g
Fiber	2.6 g	2.7 g	1.7 g	2.3 g	2.0 g
Protein	7.7 g	6.7 g	7.8 g	7.8 g	7.9 g
Sodium	0.72 g	0.68 g	0.94 g	0.8 g	0.9 g
Salt	1.8 g	1.7 g	2.35 g	2 g	2.25 g

First of all, we calculated the average amount of salt per 100 g of product in all the pizza dough bases in the sample; this equaled 2.02 g. Subsequently, we made six basic pizza dough balls reducing the salt content by 7%, 10%, 16%, 23%, 30%, and 53%, respectively, based on the previous average obtained. These percentages were not randomly chosen, but are the same as those applied by [9]. We also prepared a pizza dough using 2.02 g of NaCl (the average content of salt in our sample), to use as a reference model.

A panel with eight members (four males and four females, aged 24–54 years) was assembled: no information on the salt content of each sample was provided and each panelist was served a piece containing about 5 g for every pizza dough ball and a piece of a standard pizza dough (also 5 g). Panelists were asked to taste each sample at one minute intervals but also to rinse their mouths during this break. They then had to indicate the amount of salt they had perceived on a graduated scale (−3 = very sweet, +3 = very savory), as represented in the next figure (Figure 1).

**Figure 1.** The graduated scale.

3.1. Ingredients and Participation

The ingredients used to prepare the standard pizza dough were 300 g of Divella flour 0, 120 mL of Sant'Anna mineral water, 60 mL of Granarolo low-fat milk, 12.5 g yeast, 12 g extra virgin olive oil, 6 g white sugar, and 2.02 g of salt, subsequently added to the mixture. The ingredients were mixed in a mechanical kneader/bread-making machine (Bimby) for 4 min, then 2.02 g of salt (the average amount of salt content in the processed pizzas analyzed) was added. Later, the dough was manually kneaded for another 5 min and left to stand for 10 min at 38 °C and 80% humidity. It was then rolled out to a thickness of 7 mm and left to rest for another 20 min at 38 °C and 80% humidity. The dough was rolled out a second time to a thickness of 12 mm, repeatedly pierced with a fork, and baked for 12 min at 210 °C.

The ingredients used for preparing the low-salt-content pizzas were 600 g of Divella flour, 0.240 mL of Sant'Anna mineral water, 120 mL Granarolo low-fat milk, 25 g yeast, 24 g extra virgin olive oil, 12 g white sugar, and salt, successively added to the mixture. Also in this case, the ingredients were mixed in a mechanical kneader/bread-making machine for 4 min. Afterwards, the dough was divided into six rolls of 100 g each; to each of them 1.88 g, 1.82 g, 1.70 g, 1.55 g, 1.41 g, and 0.95 g of table salt was added, respectively, equivalent to the average percentage of reduced salt of 7%, 10%, 16%, 23%, 30%, and 53%, respectively. Thus, each dough ball was manually mixed for another 5 min. The mixture was

left to stand for 10 min at 38 °C and 80% humidity, rolled out to a thickness of 7 mm, and left to rest for another 20 min at 38 °C and 80% humidity. The dough was pressed a second time to a thickness of 12 mm, repeatedly pierced with a fork, and baked for 12 min at 210 °C.

3.2. Sensorial Analysis

The panel was made up of eight people who did not present any taste and/or smell sensorial problems or disorders. Informed consent was obtained from the participants. They were not aware of the amount of salt present in each different sample. In literature, other sensorial experiments which involved a small size panel are as follows: the same [9], who involved 18 participants, [50] in their study with 10 panelists, [51], with 6 panelists.

The analyses were carried out in a single session lasting a total of 45 min, divided in six rounds, one for each different degree of salinity of the pizza dough. Participants were also asked not to exchange information in order not to influence each other and to be able to give their true opinion. Unlike the experiment carried out by [9], the panelists had no training at the beginning of the experiment in distinguishing the various pizza doughs.

Procedure

Subjects were seated in a room and each of them was given a pencil and a notebook of six sheets reporting the scale shown above, in order to mark the degree of perceived saltiness. In turns, each subject was given a standard pizza piece of dough, from time to time with a different degree of salinity; therefore, each of them had to eat the piece of standard pizza dough, then the reduced-salt-content piece. The samples were chewed for about a minute and swallowed. Participants then had to express the salinity they had perceived on the given scale. At the end of each round, they could rinse their mouths with mineral water in order to reset the value of salt perceived. This procedure was repeated up to five times, and each subject was randomly given the dough samples for standard pizza and the remaining dough with reduced sodium content.

3.3. Findings

One of the most frequently applied strategies for the reduction of sodium is the so-called “reduction by stealth”, characterized by slight reductions in sodium content, this is repeated continuously in a medium-long time frame in such a way that the consumers do not perceive the difference. The use of this strategy requires an adequate knowledge of consumer tastes to avoid a further increase in salt in food. According to our experiment, it was possible to detect how the sample reacted to the 7%, 10%, 16%, 23%, 30%, and 53%, respectively, reduction of sodium chloride/salt in the pizza dough. Data were collected and are shown in Table 2.

Table 2. Panelists’ evaluations.

Salt Reduction %	Panelists							
	1	2	3	4	5	6	7	8
−7	0	0	+1	+2	0	+1	+2	−1
−10	0	−1	0	0	0	0	+2	−1
−16	−1	−1	0	0	−1	0	0	−2
−23	−2	−1	−2	−1	+1	−1	−1	−3
−30	−3	−2	−3	−2	−1	−1	−1	−2
−53	−3	−3	−2	−3	−2	−3	−3	−3

Based on the results, subject number 4 did not indicate any noticeable change in the sodium content up to a 16% reduction (a possible explanation could be that he does not use much salt in his

diet and therefore is not addicted to the salty taste). On the contrary, subject number 8 considered the first sample, with a reduction of only 7% of sodium chloride, too bland; possibly the subject is used to eating very salty foods and, consequently, does not adequately perceive the percentage of salt present in food.

In general, as in the experiment of [9], it can be observed that the panelists did not perceive any difference between the standard sample and a reduced salt content of up to 10% (as also shown also by [8]). In the case of a reduction of 16%, a noticeable insipidity was recorded by half of the sample, 50% of subjects. From this data it emerges that a 10% reduction in salt content in pizza dough would be almost totally imperceptible to consumers who are not aware of this reduction. Therefore, consumers could unknowingly consume a healthier product without any particularly relevant changes to taste, providing the long-term health benefits of a less salty/low-salt daily diet. The hypothesis is therefore confirmed. According to these results, the adequate quantity of salt would be about 1.82 g per 100 g of pizza dough. The next table (Table 2) presents the panelists' evaluations.

The amounts of salt contained in the product analyzed are different from those contained in particular foods, such as gluten-free or, in general, those sold in pharmacies in Italy. Similarly, in other countries, this amount is lower, as represented in the following table (Table 3).

Table 3. Content of salt per 100 g of pizza dough in some countries.

Italian Gluten-Free/Organic/Lactose-Free Pizza Dough				
<i>Soluzioni alimentari</i>	<i>Schar</i>	<i>Nutrifree</i>	<i>Probios</i>	<i>Sorgente Natura Bio (with spelt)</i>
1.6 g	1 g	1.82 g	1g	1.4 g
U.S.A.				
<i>Pillsbury</i>	<i>Mama Mary's</i>	<i>Guttenplans</i>	<i>Wenner</i>	<i>Kontos</i>
2% or less	2% or less	2% or less	not specified	2% or less
United Kingdom				
<i>Tesco</i>	<i>Northern Dough</i>	<i>Sainbury's</i>	<i>Napolina</i>	<i>Panartisan</i>
0.9 g	1.5 g	0.7 g	1.7 g	1.1 g
Sweden				
<i>Pagen</i>	<i>Semper (Gluten free)</i>	<i>Fontana</i>	<i>Crispino (Gluten free)</i>	
0.7 g	0.83 g	1.2 g	1.2 g	

As illustrated, apart from the United States, where products do not specify the precise content of salt in grams, the other cases show an amount of salt lower than the percentage we recorded as the ideal amount (excluding Nutrifree, which contains exactly 1.82 g of salt per 100 g, although it is a lactose-free product commercialized in pharmacies).

4. Discussion

The consumer assessment of sensory quality clearly highlights how a 10% reduction in salt can be applied without negative consequences on taste. Observing the data from different countries, moreover, reaching this objective seems to be realistically possible. Furthermore, this result is consistent with [8], who studied salt reduction in bread, and assumes a particular relevance considering that according to the study of [6], lowering the sodium intake by only 10% leads to a significant reduction in deaths due to cardiovascular diseases (this had a substantial impact on the economy of the United Kingdom with a saving of approximately 1.5 billion pounds per year).

It is clear that pizza dough is only one example of salty foods and, obviously, a reduction in sodium chloride is necessary in most foods. The case of the UK is exemplar even if, as previously shown, for this kind of product the average salt content is lower than in the Italian one. In fact, according to an analysis organized by Consensus Action on Salt and Health (CASH) [52], a scientific group concerned with issues related to salt, only 1 food category out of 28 meets Public Health England's

2017 Salt Reduction Targets. For example, products such as M&S Salt & Vinegar Chiplets (2.8 g/100g), Sainsbury's Taste the Difference West Country Farmhouse Butter with Cornish Sea Salt (2.13 g/100 g), and The Fishmonger Smoked Mackerel Fillets with a Piri Piri Flavouring (3.8 g/100 g) exceed the salt target (Consensus Action on Salt & Health, 2017).

5. Conclusions

As also verified by [9], this study, applied to an Italian context, shows that a reduction up to 10% of salt content in pizza dough is possible without modifying its organoleptic characteristics. This means that food companies should consider the possibility to reduce this ingredient and provide a healthier product. The benefits of this choice are evident:

- (1) Companies could contribute to public health, an objective named by the UN 2030 Agenda;
- (2) A greater attention to healthiness could become a more important marketing variable on which to build a precise promotional campaign. Since organoleptic characteristics do not change, the product is perceived as before, but with an added advantage, that is, greater wholesomeness. From this point of view, food companies do not have to create a specific product line for health-attentive consumers but can provide a product for all.

Promotion is the variable which food companies have to insist on, in order to communicate the improvement in terms of quality and giving consumers the possibility to know the salt issue and have a greater awareness about their selection. Packaging could further help these companies to communicate salt reduction. Moreover, they could introduce a sticker to indicate the moderate amount of salt their food contains, exploitable also by producers of sweet food with regards to sugar.

The panelists' evaluations show that this reduction must not be too high in order not to sacrifice taste. Considering the limits suggested by the WHO and the amounts of salt in processed foods, the risk of overcoming the threshold of 5 g per day is high. In the case of pizza dough, our analysis involved 100 g of product, but in actual fact, the whole product weighs more. In addition, consumers had to add some toppings—this obviously means more salt and, consequently, the possibility of almost reaching the limit of 5g in a single food. As underlined by [6], about 80% of the daily sodium intake comes from processed foods and foods consumed outside the home. The commitment to reduce the level of sodium in the diet can be zeroed by the high concentration of salt in this kind of food, therefore, the real progress may be generated firstly by reducing the levels of salt in processed foods. A reduction, albeit small, is possible without modifying taste and if applied also to other foods, could have important benefits in order to lower the daily consumption of sodium chloride. An alternative solution could be to use salt substitutes, as suggested by [53], who tested a plant aqueous extract, which comparatively has a lower content of sodium than NaCl (−43%). The study by [9] identifies another two possible strategies to obtain a sodium reduction of up to 25%. The first strategy was achieved by adding only 25% of sodium during the preparation of the standard recipe, while the remaining 75% was added as NaCl big grain 30 s before the end of the mixing time. The samples made using this technique resulted as equally salted as the recipe containing only fine salt. The second strategy has been obtained by using 25% sodium in the initial phase of preparation of the dough, while the remaining 75% was diluted in an aqueous solution and vaporized on the pizza crust after the second period of rest.

A third, but not less important way, could be a promotional campaign to increase consumer awareness on this topical issue, providing them with more information about salt overconsumption. In 2003, for example, the UK Food Standards Agency began a program to reduce the average daily intake of salt for adults by up to 6 g, encouraging all sectors of the food industry to make recipe reformulations. The Italian Society of Human Nutrition (SINU) [54] promotes the reduction in the use of sodium chloride in Italy, studying the phenomenon, providing data, and supporting the so-called Salt Awareness Week, a world initiative fostered by the World Action on Salt and Health.

The recent debate on public health has to involve also companies and their marketing strategies; trying to provide a better product, more healthy but with no changes in terms of taste, is a moral duty

but also a strategic action (it is one of the UN's Millennium Development Goals, [55]. Our experiment shows how it is possible to create a healthier product; this would mean an improvement of reputation for companies and a healthier option for consumers, as also demonstrated by [9]. As a matter of fact, from a marketing point of view, food companies should and could work to make their products healthier without altering their organoleptic characteristics. In this way, with adequate promotional strategies, wholesomeness could become a relevant variable in the competitive arena. A reduction of salt without effects on taste could allow companies to promote their products not only for a niche target, but for a larger one, by providing the same product for their papilla but more wholesome for their health.

The findings of this research are not without limits. Mainly they include the following:

- (1) The small number of panelists, that means that since this is an experimental qualitative study, findings are not statistically generalizable; the sample needs to be enlarged in order to gather more information;
- (2) The product tasted by the participants was homemade and not a processed food. This means that their taste could be a little bit different;
- (3) The analysis was carried out on a single product and this means that for other categories of product, the percentage of salt reduction could be perceived differently;
- (4) It is necessary to consider people from different countries because food habits can affect the perception of food. Consumers from countries in which processed food is very savory could perceive a salt reduction of 10% more markedly, and the same could be the case where food is generally slightly salty (in the same, Italy bread is traditionally different in amount of salt when comparing central regions and southern ones), so it is essential to clarify that different traditions could generate different findings compared with these ones.

There is room for further research on a larger sample, and, for example, it would be interesting to repeat this experience using pizzas with different toppings as this would provide different salt levels from those of a simple pizza crust. Moreover, future research should compare different kind of foods in order to verify if this percentage of reduction can be considered also for other products. A further step could be a cross-cultural study by involving consumers from various countries, considering the different approach they could have; this is important to know in order to apply adequate strategies in a specific national context. Further research should analyze the same problem from the point of view of sugar overconsumption, which is similarly problematic as that related to salt.

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