

Chapter 3

EXPERT VIEWS ON MOST SUITABLE MONETARY INCENTIVES ON FOOD TO STIMULATE HEALTHY EATING

Chapter

3

Wilma E Waterlander
Ingrid HM Steenhuis
Emely de Vet
Albertine J Schuit
Jacob C Seidell

European Journal of Public Health 2010, 20(3): 325–331

Abstract

Background: Pricing strategies are an important component in the marketing mix and may also be useful in stimulating healthier food choices. However, due to competing interests and feasibility problems, the introduction of pricing strategies is complicated. For successful introducing food pricing strategies, it is essential to explore incentives that are not only promising but also realisable and being approved by different sectors.

Methods: We aimed to assemble a list of pricing strategies by exploring expert views using the Delphi method. Subjects included experts from academia, industry, retail, agriculture, policymakers, consumers and non-governmental organizations. Data were collected in three rounds. In round one, experts designed promising pricing strategies. Based on a time-budget model incorporating **S**leep, **L**eisure, **O**ccupation, **T**ransportation, and **H**ome-based activities (SLOTH) these strategies were in the subsequent rounds judged on several criteria. Results were analysed using median and inter quartile deviations (IQD) scores.

Results: We found fair consensus levels among experts and a varied list of promising pricing strategies. The panel agreed on the potential success of offering small presents, providing price-cuts on healthy foods, and discounting healthier foods more frequently. Also, it was found that experts gave higher rates to pricing strategies for which the implementation responsibilities could be placed elsewhere.

Conclusion: The resulted list of promising monetary incentives is an essential first step for the future design of pricing strategies. Following this study, it is important to determine how to make solid agreements on responsibility and implementation issues. Also, consumer perceptions regarding the proposed pricing strategies should be studied.

Keywords: pricing strategies; food; healthy eating; economic incentives; prevention

Introduction

In most countries, the majority of the population does not eat according to dietary guidelines, especially among lower socio-economical groups ^{1, 2}. One option to stimulate healthy eating is by use of pricing strategies. Sales promotions form an important part of the marketing mix, and are widely used to stimulate consumers to buy certain products ³.

Different studies have shown that price is indeed an important determinant in food choice ⁴⁻⁶. Also, it is shown that diet quality and diet costs are positively correlated ⁷⁻⁹. Food choice in general, and the healthier food choice in particular, may therefore be subjective to economic factors ¹⁰. For that reason, pricing strategies seem a fitting intervention to stimulate healthy eating. Yet, the introduction of food price measures is complicated. Previously suggested monetary incentives such as taxes or subsidies ^{11, 12}, that have proven to be effective in decreasing the prevalence of tobacco and alcohol use ^{13, 14}, seem complex to implement. Unlike tobacco and alcohol, food is a basic element for survival and the discrimination of healthy versus unhealthy foods is not well established ^{12, 15, 16}. Also, divergent involved sectors and feasibility issues may raise barriers to the deciding stages of the introduction of food price strategies ¹⁵.

Nevertheless, both opinion-based and scientific articles have suggested that pricing strategies can be a useful tool in changing dietary behaviour ¹⁷⁻²⁰. A wide exploration of potential pricing strategies, including and going beyond taxes and subsidies, might form a solution for the listed barriers. This exploration could include the potential use of strategies known from marketing literature such as ‘premium promotions’ or ‘sampling promotions’ ³, and could focus on strategies that are approved by different sectors involved.

A well-founded method that has found to be of great value in creating consensus among complex problems, is the Delphi method ²¹⁻²³. This paper describes the results of such a Delphi study by aiming to assemble pricing strategies that may be feasible for implementation and are promising in stimulating healthier food choices.

Methods

Characteristics of the Delphi method

Key features of the Delphi include the use of experts, different rounds, controlled opinion feedback, and giving participants the possibility to change their opinions ²³,

²⁴. Our study was designed in line with those features. Comparable with other Delphi studies, we departed at some points from the original Delphi ²⁵. The results were obtained in the Netherlands, and included multinational viewpoints ²⁶. Methods and procedures of this study were approved by the Medical Ethical Committee of VU University Medical Centre Amsterdam.

First round

Sample

In order to create a representative expert panel, we first identified the most important involved sectors, namely: (A) academic research, (B) food processing, industry, retail, agriculture, and (C) policymakers, Public interest, and Non-Governmental and Consumer organizations. Four researchers made a list of organizations and institutions from these sectors. From this list, key individuals were indicated, resulting in 81 experts. These experts were sent a postal invitation and were asked to take part in all three Delphi rounds. Table 3.1 shows the number of invited and participated experts for the different rounds and their expertise. The total panel size of the first round was 29 (response rate 36%). This panel may have been biased since experts may have decided to participate because they were interested in the topic. Still, we made effort to create a heterogeneous panel, which included experts with a high position in their organization. As Table 1 shows, the non-response was similar in all three sectors, and there were no signs of selective drop-out. All experts were native Dutch.

Ideation session

Comparable with the classical Delphi, the first round was designed to discover ideas using open-ended questions ²³. For this purpose, we organized an ideation session in which the experts had a structured discussion. The use of an ideation session departs from the original Delphi since no anonymity could be provided. However, this method provided the opportunity for an open debate in which experts from different sectors could familiarize with interests of importance in other fields. Also, active participation may enlarge further cooperation ²².

The ideation session consisted of two general discussion and two brainstorm rounds enabling us to discuss the two major types of pricing strategies (stimulating *healthy* eating and discouraging *unhealthy* eating) separately. In the brainstorm rounds, experts discussed in smaller subgroups and were instructed about the focus of the session and assigned to discussing exclusively price incentives.

Table 3.1 Participating experts in the Delphi study and response rates per round, per sector, and per expertise
 All 29 1st round experts and 35 additional experts were invited to the 2nd round
 All 44 2nd round experts were invited to the 3rd round

Sector	Field of expertise	FIRST ROUND (n = 29) ^a		SECOND ROUND (n = 44) ^{b,d}		THIRD ROUND (n = 36) ^c	
		invited	participated	invited	participated	invited	participated
A Academic Research	Economics	7	2	→	3	→	2
	Food and health	18	4	→	13	→	11
	Business marketing	1	1	→	2	→	1
	Food and agriculture	1	1	→	1	→	1
	TOTAL	27 (17 m, 10 f*)	8 (4 m, 4 f)	→	18 (8 m, 10 f)	→	15 (6 m, 9 f)
B Food processing, Agriculture, Trade and Industry	Consumer organisation	1	1	→	1	→	1
	Food processing	11	3	→	4	→	4
	Retail/branch organisation	13	4	→	3	→	2
	Food consultancy	3	3	→	4	→	2
	Food marketing	2	0	-	-	-	-
	Fast food sector	1	0	-	-	-	-
	TOTAL	31 (22 m, 9 f)	11 (4 m, 7 f)	→	12 (4 m, 8 f)	→	9 (3 m, 6 f)
C Policy, Public Interest, NGO	Semi-governmental research centre	9	6	→	9	→	8
	Dutch Ministry	7	2	→	2	→	2
	Public Health Council	3	1	→	1	→	1
	Food Council	3	1	→	2	→	1
	European Food Organisation	1	0	→	-	-	-
	TOTAL	23 (14 m, 9 f)	10 (4 m, 6 f)	→	14 (6 m, 8 f)	→	12 (6m, 6 f)
OVERALL	81	29 (12 m, 17 f)	→	44 (18m, 26 f)	→	36 (15 m, 21 f)	

* m = male; f = female

- a. 2 experts dropped out: 1 from a semi-governmental research centre and 1 from a retail/branch organization
- b. 61% of the participants in the second round were participant in the first round, 29% were additionally selected with a response rate of 43%.
- c. 8 experts dropped out: 1 from a retail/branch organization; 2 from food consultancy; 1 expert from the Food Council 1 expert on economics; 2 experts on food and health; and 1 expert from a semi-governmental research centre.
- d. 82% of the participants from the second round also joined the third round
- e. The third round consisted for 64% of original participants from the first round

2 experts dropped out between the 1st and 2nd round^a
 8 experts dropped out between the 2nd and 3rd round^c

Data analyses

The ideation session resulted in a list containing multiple pricing strategies. These strategies were inductively categorized into subcategories, a method regularly used in qualitative data analysis ²⁷. Subsequently, comparable subcategories were combined into larger categories and overlapping strategies were redefined as 1, resulting in four broad categories and 29 strategies that were questioned in the second round (Table 3.2).

Second round

Sample

Participants in the second round included experts from the first round and an additional group for broadening knowledge and viewpoints. Both experts recommended by first-round participants and experts who were not able to join the first round but indicated an interest in taking part in the subsequent rounds were invited. Of the first-round participants, $n = 27$ (93%) also completed the second round. For the additional group, $n = 35$ experts were invited, of which $n = 17$ agreed to participate and completed the questionnaire (49%). The total panel size in this round was 44 (Table 3.1).

Questionnaire

In the second round, experts were asked to evaluate the first-round strategies. They received a postal questionnaire and were requested to judge the strategies based on 8 criteria using a 7-point Likert-scale. For the design of those criteria was started from the **S**leep, **L**eisure, **O**ccupation, **T**ransportation, and **H**ome-based activities (SLOTH) model. SLOTH is an economic model used to indicate how people allocate their resources of money and time in order to maximize utility. The model contains 4 main factors that can be used to prioritize interventions: economic efficiency, equity, effectiveness, and feasibility. Some factors contain sub-factors, feasibility contains for example: legality, politics, and public popularity ^{28,29}. SLOTH was used since it combines economic, political, and public health perspectives and is a sufficient guide in determining promising economic measures, which fits well with our research aims ^{23,29}. To refine the 4 factors from SLOTH, the sub-factors, a previously conducted Delphi study on tobacco policy, together with literature on complicating factors surrounding food pricing strategies, were used ³⁰. Based on these three sources, 8 criteria were designed which were judged suitable to give an all-embracing judgement about the food pricing strategies:

- (1) *Political feasibility* – Is the intervention achievable from a political viewpoint?
- (2) *Practical workability* – Is the intervention practical doable?
- (3) *Opportunities for implementation* – To what extent can the intervention be carried through on the long run?
- (4) *Effectiveness* – Does the intervention have a sufficient effect size/impact?
- (5) *Affordability* – To what extent is the intervention affordable in the long term?
- (6) *Social justice* – To what extent is the intervention justifiable for different socio-economical groups?
- (7) *Consumer acceptance* – To what extent is the intervention acceptable from the viewpoint of consumers?
- (8) *Industry acceptance* – To what extent is the intervention acceptable from the viewpoint of the industry/producers/retail?

Data analyses

First, it was analysed whether the eight criteria used in the questionnaire were independent scales using Kendall's tau non-parametric correlation matrix. Second, we analysed the extent to which each individual expert agreed with the strategies using median scores. The scores ranged from 1 to 7, and a cut-off point of 3.5 was used to indicate that experts agreed with the strategy. The conservative cut-off point of 3.5 was chosen since it was considered important that strategies were not excluded from further consideration too easily. Third, the level of consensus between experts was analysed using interquartile deviations (IQDs). IQD is a measure of statistical dispersion and indicates the distance between the 25th and the 75th percentiles. A smaller IQD represents a larger consensus, and an $\text{IQD} \leq 1$ indicates a good consensus²³.

Third round

Sample

Participants from the second round were also invited to the third round. Of the total sample, 64% completed all three rounds (Table 3.1).

Questionnaire

Preceding the third round, experts were provided with statistical group feedback from the second round. Based on this feedback, experts were given the opportunity to change their answers. In the third round, we further examined the strategies that had been indicated as potentially effective in the second round. Strategies were found to match this criterion if they had a median score ≥ 3.5 on effectiveness. Also, strategies

were judged on low consensus scores ($IQD \geq 1$). In total, 15 out of the original 29 strategies fulfilled these criteria and were again proposed to the experts using an electronic questionnaire. For a second time, experts were asked to judge the 15 strategies on the 8 criteria. Also, a sixteenth question was added in which experts ranked the strategies from 1 (best) to 15 (worst).

Data analyses

Consistent with the second round, median and IQD scores were analysed. For the rank question, results for the three different experts groups were analyzed separately using mean values. All statistical analyses were conducted using SPSS statistical software (version 15.00, SPSS Inc, Chicago, IL)

Results

First round

The ideation session resulted in various strategies that could be divided into four subcategories: (1) taxes - e.g. healthy food options at a lower VAT rate - (2) government interference and insurance system - e.g. additional food allowance for low-income groups - (3) way of offering and presentation - e.g. post with recipes: healthy, easy and cheap - (4) price and discounts - e.g. healthy food options on special offer (Table 3.2).

Table 3.2 Pricing strategies resulting from the 1st round and questioned in the 2nd round (scores based on a seven-point Likert scale)

Items resulting from the first Delphi round		2 nd round scores	
		Mdn <i>Effectiveness</i>	IQD
A. Taxes:			
A1	* Healthy food options at a lower VAT rate	4	2
A2	* Calorie charge: charge based on energy density and nutrient density	4	3
A3	Tax rise on unhealthy food items	3	3
A4	Introduction of a special tax on fabricated products	2	2
A5	Extra taxes on unhealthy raw produce (sugar/fat)	3	2
B. Government interference and insurance system:			
B1	Extra food allowance for low income groups	2	3
B2	Insurance premium reduction when a healthy diet is followed	3	2
B3	Extra governmental allowance to retailers to make healthy food items generally less expensive	4	2

B4	* Bonus for low income consumers assigned when a certain amount of healthy products are purchased	3	2
B5	More expensive license for purchase settings when a certain amount of unhealthy products are sold	2	3
B6	Prohibit special offers on unhealthy food items	3	4
C. Way of offering and presentation:			
C1	* Post with recipes: healthy, easy, and cheap ^b	4	2
C2	* Offering an additional healthy product for free on the purchase of a healthy product	4	2
C3	* Offering small presents/extras with healthy food items ^b	4	2
C4	* Two healthy products for the price of one	4	2
C5	* Savings stamps on healthy food items along with attractive actions ^b	4	2
C6	Quit quantity rebate on unhealthy food items	3	3
D. Price and Discount strategies:			
D1	* Healthy food options more often on special offer ^b	5	2
D2	* Sudden price rise for unhealthy food items	3.5	3
D3	* Combination discount: offering discounts on daily or weekly meal options ^b	4	2
D4	* Offering the healthy option of comparable products for a lower price ^b	4	2
D5	Stickers to receive discount on self-selected healthy products	3	2
D6	Food coupons to receive discount on healthy food items exclusively for low income groups	3	2
D7	Direct discount on healthy food items with a discount card exclusively for low income groups	3	3
D8	* Price cuts on healthy food items ^b	4	2
D9	Making healthy products relatively cheaper by offering them in larger amounts for the same price.	3	2
D10	Portion size: making unhealthy products more expensive by reducing portion sizes.	3	3
D11	* Making unhealthy products more expensive in order to finance subsidies on healthy food items	4	3
D12	* Making both healthy food items cheaper and unhealthy food items more expensive	4	3

* Selected for the third round, based on a median score of ≥ 3.5 on the item effectiveness (scale 1 – 7)

^a IQD = Inter Quartile Deviation; indicates the distance between the 25th and the 75th percentiles

^b Median score ≥ 3.5 on all 8 criteria in the second round

Second round

Kendall's tau correlation matrix revealed that for most pricing strategies, the 8 criteria correlated significant. However, it also revealed that, except for political feasibility and practical workability in strategy A2, and opportunities for implementation and practical workability in D1, none of the criteria had a correlation $>.80$; indicating that the 8 criteria were independent scales. Therefore, all criteria were separately included in analyses.

From these eight criteria we first looked more specifically at the effectiveness criterion. In total, 15 strategies had an effectiveness median ≥ 3.5 (scale 1 – 7). Of these strategies, 10 also scored a median ≥ 3.5 on political feasibility, 10 on practical workability, 11 on implementation opportunities, 14 on affordability, 14 on social justice, 12 on consumer acceptance, and 10 on industry acceptance. In total seven strategies scored a median ≥ 3.5 on all 8 criteria (Table 3.2). In contrast with high median scores, we found low consensus scores; all strategies had an IQD ≥ 2 . Strategies with an IQD ≥ 1 and a median ≥ 3.5 on the criterion effectiveness were selected for the third round (Table 3.2).

Third round

Table 3.3 shows the outcomes of the third round. In general, higher consensus levels were obtained compared to the second round. With respect to agreement, measures were rated differently on the listed criteria. For example, introducing a sudden price rise in unhealthy food items scored a median of 2 on political feasibility, in contrast to a score of 4 on effectiveness and affordability. In general, median scores were high (78% median ≥ 3.5) and consensus was good (67% IQD ≤ 1). Two strategies had both median scores ≥ 3.5 and IQD scores ≤ 1 on all 8 criteria, indicating that experts agreed on the quality of those strategies. These strategies were offering small presents with healthy food items and providing price cuts on healthy food items.

Additionally, experts were asked to rank the strategies. Table 3.4 shows the results of the overall ranking and those of the separate expert groups. Scores were given from 1 to 15, with a lower score indicating a higher ranking. Overall, the strategy of putting healthy food options on special offer more frequently had the highest rank (mean 5.5), and introducing a sudden price rise of unhealthy food items the lowest (mean 11.4). However, clear differences between expert groups were observed. Contrary to the overall rank of 15, sector B ranked the strategy of a sudden price rise for unhealthy

Table 3.3 Results 3rd round, Median (scale 1-7) and IQD scores of pricing strategies outlined by the eight criteria

Price Strategy	Political feasibility		Practical workability		Implementation opportunities		Effectiveness		Affordability		Social justice		Acceptance consumers		Acceptance trade & industry		% IQD \leq 1 per strategy
	Mdn	IQD ^a	Mdn	IQD	Mdn	IQD	Mdn	IQD	Mdn	IQD	Mdn	IQD	Mdn	IQD	Mdn	IQD	
A1*	4	2	4	2	4	2	4	2	4	2	5	2	6	1	4	2	13%
A2	3	2	3	2	3	1	4	1	4	1	4	1	3	2	3	2	50%
B4	4	2	3	1	4	1	4	2	4	2	4	2	4	2	4	2	25%
C1	5	2	5	1	5	1	4	2	5	1	5	1	5	1	5	1	75%
C2	5	1	4	1	4	1	4	1	3	1	4	1	5	1	4	2	88%
C3	5	1	5	1	4	1	4	1	4	0	5	1	5	1	5	1	100%
C4	4	1	4	2	4	1	4	2	3	2	4	1	5	0	3	2	50%
C5	5	2	5	1	5	2	4	2	4	1	5	1	5	0	5	1	63%
D1	5	1	5	1	5	1	4.5	1	4	2	5	1	5	1	5	1	88%
D2	2	1	3	0	2	1	4	2	4	1	3	2	2	1	2	0	75%
D3	5	1	5	2	4	1	4	1	4	1	5	1	5	1	4	1	88%
D4	5	1	4	1	4	1	4	1	4	1	5	1	5	1	4	2	88%
D8	5	1	5	1	5	1	4	1	4	0	5	1	5	0	4	1	100%
D11	3	2	3	1	3	2	4	2	4	1	4	1	3	1	2	1	63%
D12	3	2	3	2	3	2	4	1	4	1	4	2	4	1	2	2	38%
% IQD \leq 1 per element	53%		67%		73%		53%		73%		73%		87%		53%		

* For clarification of the strategies see Table 3.2

a. IQD = Inter Quartile Deviation; indicates the distance between the 25th and the 75th percentiles

Table 3.4 Overall ranks of the pricing strategies and by different groups of expertise

Price strategy	Rank overall (1-15)	Mean	Rank Sector A (Δ)	Mean Sector A	Rank Sector A	Rank Sector B (Δ)	Mean Sector B	Rank Sector B	Rank Sector C (Δ)	Mean Sector C
D1*	1^a	5.45	2 (-1)	5.31	1 (-)	1 (-)	5.75	3 (-2)	5.42	
A1	2	6.27	1 (+1)	4.62	2 (-)	2 (-)	6.50	10 (-8)	7.92	
D4	3	6.42	3 (-)	5.85	11 (-8)	11 (-8)	10.00	1 (+2)	4.67	
D8	4	6.73	5 (-1)	6.92	5 (-1)	5 (-1)	8.13	4 (-)	5.58	
C1	5	6.73	6 (-1)	7.08	4 (+1)	4 (+1)	7.63	5 (-)	5.75	
D3	6	7.42	11 (-5)	8.15	10 (-4)	10 (-4)	9.50	2 (+4)	5.25	
C3	7	7.88	7 (-)	7.62	8 (-1)	8 (-1)	8.38	9 (-2)	7.83	
B4	8	7.94	10 (-2)	8.15	6 (+2)	6 (+2)	8.25	7 (+1)	7.50	
D12	9	7.97	8 (+1)	7.69	9 (-)	9 (-)	8.38	11 (-2)	8.00	
C5	10	8.09	4 (+6)	6.77	14 (-4)	14 (-4)	10.88	8 (+2)	7.67	
C2	11	8.39	9 (+2)	7.92	15 (-4)	15 (-4)	11.00	6 (+5)	7.17	
D11	12	9.61	12 (-)	8.15	12 (-)	12 (-)	10.38	13 (-1)	9.17	
C4	13	9.73	13 (-)	10.00	13 (-)	13 (-)	10.50	12 (+1)	8.92	
A2	14	10.18	14 (-)	10.46	7 (+7)	7 (+7)	8.38	14 (-)	11.08	
D2	15	11.42	15 (-)	13.46	3 (+12)	3 (+12)	7.50	15 (-)	11.83	

* For clarification of the strategies see Table 3.2

^a. Rank 1 = the best score; rank 15 = the worst score

Δ = difference in rank number between the named expert group and overall rank

food options in third place. Also, while offering the healthy option of comparable products for a lower price was ranked in third place by the overall group, this same strategy was ranked in eleventh place by sector B. Sector C ranked putting healthy food options on a lower VAT rate in tenth place, while the overall group ranked this in second place.

Discussion

This study resulted in a list of pricing strategies that by a heterogeneous expert panel had been indicated as being promising in stimulating healthier food choices and being feasible for implementation. This result is an essential first step for the future design of pricing strategies. Former studies argued that barriers surrounding pricing strategies may form a main obstacle for implementation. In line with this, we found that experts did have the tendency to overestimate the potential of pricing strategies for which the implementation responsibilities could be placed elsewhere. Nevertheless, our results revealed that several pricing strategies have potential. The strategy with the best prospects was discounting healthier food options more frequently.

Several authors have proposed pricing strategies as a tool in changing dietary behaviour, and several arguments for price incentives are listed^{17-20,31,32}. Experiments in controlled settings showed that price reductions are effective in changing food purchases³³. Also, studies on fiscal incentives revealed that taxes and subsidies on food may be effective^{16,34-36}. Based on this, pricing strategies seem a promising intervention tool. Nevertheless, there are a lot of complicating factors surrounding pricing strategies. For example, pricing strategies may: 1) distort markets, 2) result in cross elasticity, 3) have regressive effects, 4) can not be implemented because of different prevailing interests^{15,34,37}. In order to overcome these barriers, data restricted to the effectiveness of pricing strategies may not be useful.

We found clear differences in the pricing strategies ratings regarding feasibility on the one hand, and effectiveness on the other hand. For example, the introduction of a sudden price rise for unhealthy food products was considered to be very effective, but scored low on political feasibility and industry acceptance. For the actual implementation of pricing strategies it is important to take this discrepancy into consideration³¹. A second point of attention is that strategies were rated differently among involved sectors, supposedly influenced by implementation responsibilities. We found that the government experts mainly preferred measures that should be performed by the

industry (best example: offering the healthy food option of comparable products for a lower price), while the industry experts mainly preferred measures that should be performed by the government (best example: putting healthy food options at a lower VAT rate). It is important to consider this carefully. Promoting a healthy diet is world-wide considered important, but apart from economic conditions in developing countries, the political view of a liberal market and the industrial view of profit making are important competing issues. Due to these financial and political interests, factual interference in the food market is not favoured ³⁸.

The strategy that fitted well with issues of conflicting interests was discounting healthy food options more frequently. This strategy was ranked high(est) by all different sectors and was indicated feasible, effective, affordable, and acceptable by the industry. This promising character is underlined by marketing research conducted previously, demonstrating substantial effects on purchasing behaviour of temporal price promotions. Price promotions are suggested to have a larger impact than price reductions since consumers tend to buy a product simply because it is on sale ³⁹. This implicates that near constant discounting of different types of healthy food items would be the best option to stimulate more healthy food purchases. Based on interaction process in the ideation session we suggest that the best way to solve the payment issue of such a strategy is to combine forces of the retail, industry and government sector. All experts in our panel were broadminded towards creative solutions, and losses for merchants may be small since the upgraded sales due to the discounts may account for the lower profit ³³.

Our Delphi study shows interesting results, however, there are some methodological points of consideration. First, the expert panel may not reflect the true expert opinion in this field. Especially, in the first round the response rate was low and sampling and identification of experts may have been exposed to subjectivity. However, we managed to compose a sample containing experts from all the important sectors. Experts with high organizational positions were invited, which may have lowered the response rates, but also raised the quality of our panel. Furthermore, compared with other Delphi studies, the response rate was acceptable ²⁴. A second point of consideration is that anonymity was provided in the second and third rounds, but not in the first round. As a rule, anonymity is a specific feature of Delphi designs as it protects participants from group pressure or obstruction from talking freely about divergent opinions ⁴⁰. However, in our study it was considered relevant that experts

from different fields became familiar with important issues in other fields. Previous authors suggested that hearing other point of views may lead to levelling of arguments and higher levels of consensus ²¹. Next to this, active participation and discussion with other experts may enlarge further cooperation in the actual implementation of pricing strategies, a phenomenon characterizing Delphi studies in general ²².

Conclusion

Our results provide a divergent list of pricing strategies that by a carefully selected group of experts had been indicated as being promising in stimulating healthier food choices. Following this study, it is important to learn how to make solid agreements on responsibility and implementation issues. Currently, different authorities do not feel responsible for introducing financial incentives on food. Also it is significant to study consumer perspectives and the effectiveness of the proposed pricing strategies in stimulating healthier food choices. This should include large scale experiments studying whether consumers would actually buy more healthy foods if this would become more financially attractive.

Key points

- Due to competing interests and feasibility problems, the introduction of pricing strategies is complicated. It is essential to explore incentives that are realizable and being approved by different sectors involved. Our study is the first that gives insight in these aspects.
- This study resulted in a list of pricing strategies that by a carefully selected group of experts had been indicated as being promising in stimulating the healthier food choice and being feasible for implementation. This result is an essential first step for the future design of pricing strategies.
- Our results reveal that experts did have the tendency to give the highest rates to the pricing strategies for which the implementation responsibilities could be placed elsewhere. This is an important finding, which is essential for future successful intervention development and implementation.
- We found that, by expert views, constant discounting of different types of healthy food items would be the best option to stimulate more healthy food purchases. Because our study included experts from the industry, retail, and government sector, it provides a unique insight in the feasibility aspects of such a strategy.

References

1. Irala-Estevez JD, Groth M, Johansson L, Oltersdorf U, Prattala R, Martinez-Gonzalez MA. A systematic review of socio-economic differences in food habits in Europe: consumption of fruit and vegetables. *Eur J Clin Nutr* 2000;54(9):706-14.
2. Giskes K, Turrell G, van Lenthe FJ, Brug J, Mackenbach JP. A multilevel study of socio-economic inequalities in food choice behaviour and dietary intake among the Dutch population: the GLOBE study. *Public Health Nutr*. 2006;9(1):75-83.
3. Hawkes C. Sales promotions and food consumption. *Nutr Rev* 2009;67(6):333-42.
4. Cassady D, Jetter KM, Culp J. Is price a barrier to eating more fruit and vegetables for low-income families? *J Am Diet Assoc*. 2007;107:1909-1915.
5. European Commission. Risk Issues. Special Eurobarometer 238/ Wave 64.1. 2006.
6. Glanz K, Basil M, Maibach E, Goldberg J, Snyder D. Why Americans eat what they do: taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption. *J Am Diet Assoc*. 1998;98(10):1118-26.
7. Maillot M, Darmon N, Darmon M, Lafay L, Drewnowski A. Nutrient-dense food groups have high energy costs: an econometric approach to nutrient profiling. *J Nutr* 2007;137(7):1815-20.
8. Drewnowski A, Monsivais P, Maillot M, Darmon N. Low-energy-density diets are associated with higher diet quality and higher diet costs in French adults. *J Am Diet Assoc*. 2007;107(6):1028-32.
9. Waterlander WE, de Haas WE, van Amstel I, et al. Energy density, energy costs and income - how are they related? *Public Health Nutr* 2010;13(10):1599-1608.
10. Maillot M, Darmon N, Vieux F, Drewnowski A. Low energy density and high nutritional quality are each associated with higher diet costs in French adults. *Am J Clin Nutr*. 2007;86(3):690-6.
11. Glanz K, Yaroch AL. Strategies for increasing fruit and vegetable intake in grocery stores and communities: policy, pricing, and environmental change. *Prev Med* 2004;39 Suppl 2:S75-80.
12. Goodman C, Anise A. What is known about the effectiveness of economic instruments to reduce consumption of foods high in saturated fats and other energy-dense foods for preventing and treating obesity? Copenhagen: WHO, Regional Office for Europe; 2006.
13. World Health Organization. Taxation of tobacco products in the WHO European Region: practices and challenges. *European Tobacco Control Policy Series*. Copenhagen: World Health Organization Regional Office for Europe; 2004.
14. Chaloupka FJ, Grossman M, Saffer H. The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Res Health* 2002;26(1):22-34.
15. Kim D, Kawachi I. Food taxation and pricing strategies to "thin out" the obesity epidemic. *Am J Prev Med* 2006;30(5):430-7.
16. Powell LM, Chaloupka FJ. Food prices and obesity: evidence and policy implications for taxes and subsidies. *The Milbank Quarterly* 2009;87(1):229-257.

17. Brownell KD. Get slim with higher taxes. *New York Times*. New York; 1994.
18. Rosin H. The fat tax: is it such a crazy idea? *New Republic*; 1998:18-19.
19. Han S, Gupta S, Lechmann DR. Consumer price sensitivity and price thresholds. *Journal of Retailing* 2001;77:435-456.
20. Nestle M. Conclusion. The politics of food choice. In: Goldstein E, ed. *Food politics. How the food industry influences nutrition and health*. Berkeley: University of California Press; 2007:358-374.
21. Keeney S, Hasson F, McKenna HP. A critical review of the Delphi technique as a research methodology for nursing. *Int J Nurs Stud* 2001;38(2):195-200.
22. Lomas J. Connecting research and policy. *Isuma* 2000;1:140-144.
23. Rayens MK, Hahn EJ. Building consensus using the policy Delphi method. *Policy, politics, & Nursing Practice* 2000;1:308-315.
24. De Vet E, Brug J, De Nooijer J, Dijkstra A, De Vries NK. Determinants of forward stage transitions: a Delphi study. *Health Educ Res* 2005;20(2):195-205.
25. Banwell C, Hinde S, Dixon J, Sibthorpe B. Reflections on expert consensus: a case study of the social trends contributing to obesity. *Eur J Public Health* 2005;15(6):564-8.
26. Allington NFB, Kattuman PA, Waldmann FA. One market, one money, one price? Price dispersion in the European Union. *University of Cambridge Judge Institute of Management Working Paper* 2004.
27. Pope C, Ziebland S, Mays N. Qualitative research in health care. Analysing qualitative data. *Bmj* 2000;320(7227):114-6.
28. Cawley J. An economic framework for understanding physical activity and eating behaviors. *Am J Prev Med* 2004;27(3 Suppl):117-25.
29. Pratt M, Macera CA, Sallis JF, O'Donnell M, Frank LD. Economic interventions to promote physical activity: application of the SLOTH model. *Am J Prev Med* 2004;27(3 Suppl):136-45.
30. Hahn EJ, Rayens MK. Consensus for tobacco policy among former state legislators using the policy Delphi method. *Tob Control* 1999;8(2):137-40.
31. Caraher M, Coveney J. Public health nutrition and food policy. *Public Health Nutr* 2004;7(5):591-8.
32. Lichtenstein DR, Ridgway NM, Netemeyer RG. Price perceptions and consumer shopping behavior: a field study. *Journal of Marketing Research* 1993;30:234-245.
33. French SA. Pricing effects on food choices. *J Nutr* 2003;133(3):841S-843S.
34. Caraher M, Cowburn G. Taxing food: implications for public health nutrition. *Public Health Nutr* 2005;8(8):1242-9.
35. Kuchler F, Tegene A, Harris M. Taxing snack foods: manipulating diet quality or financing information programs. *Review of Agricultural Economics* 2005;27(1):4-20.
36. Leicester A, Windmeijer F. The 'fat tax' economic incentives to reduce obesity, Briefing note no.49. In: The institute for fiscal studies - London; 2004.
37. Holdsworth M, Kameli Y, Delpeuch F. Stakeholder views on policy options for responding to the

- growing challenge from obesity in France: findings from the PorGrow project. *Obes Rev* 2007;8 Suppl 2:53-61.
38. Nestle M. Food Politics. How the industry influences nutrition and health. Berkely: University of California Press; 2007.
39. Blattberg RC, Briesch R, Fox EJ. How promotions work. *Marketing Science* 1995;14(3):G122-G132.
40. Goodman CM. The Delphi technique: a critique. *J Adv Nurs* 1987;12(6):729-34.