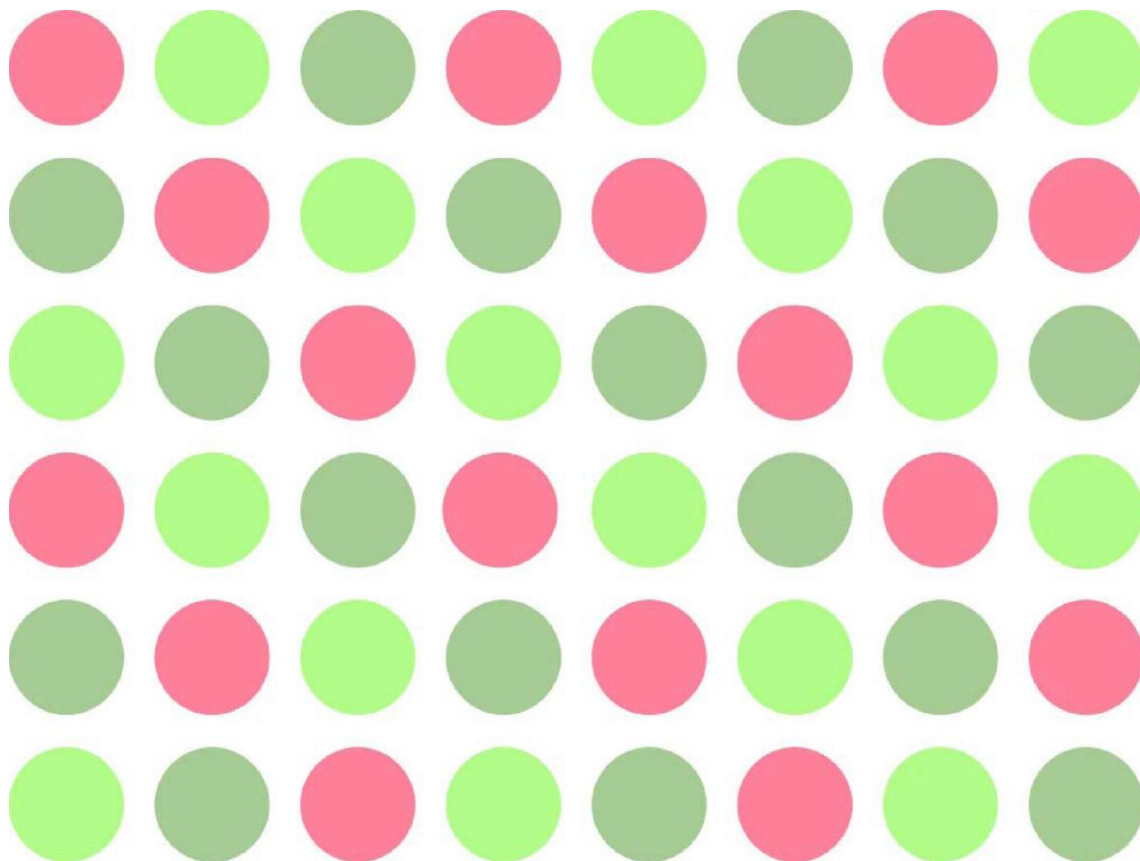


TRANS FATTY ACID CONTENT IN FOODS IN SPAIN. 2010



The NAOS Strategy, an acronym that stands for Nutrition, Physical Activity and Prevention of Obesity, is the response of the Ministry of Health, Social Services and Equality of the Spanish Government to the problem of obesity. Coordinated by the Spanish Agency for Consumer Affairs, Food Safety and Nutrition (AECOSAN), the objectives of the NAOS Strategy are to raise awareness amongst the population of the problem that obesity represents for health, promote health through healthy eating habits, and physical activity, as well as bringing together and promoting public and private initiatives that contribute to allowing citizens and particularly children and young people to adopt these healthy habits throughout their lives.

If you like more information about the NAOS Strategy, the Nutrition and Obesity Study Observatory and the activities of AECOSAN, visit our website:

www.naos.aesan.msssi.gob.es

www.observatorio.naos.aesan.msssi.gob.es



Edited by:

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Spanish Agency for Consumer Affairs, Food Safety and Nutrition, 2014

NIPO: 690-14-012-5

Trans fatty acid
content in foods in
Spain. 2010

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NAOS Strategy. Spanish Agency for Consumer Affairs, Food Safety and Nutrition (AECOSAN). Ministry of Health, Social Services and Equality.

Meeting recommended:

Trans fatty acid content in foods in Spain. 2010. Spanish Agency for Consumer Affairs, Food Safety and Nutrition. Ministry of Health, Social Services and Equality. Madrid, 2014.

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PREFACE

The reformulation of food composition is one of the main areas of work of the NAOS Strategy within the health protection activities carried out by the Spanish Agency for Consumer Affairs, Food Safety and Nutrition (AECOSAN).

The distribution of nutrients in the daily diet is a key element for a healthy diet, and an unbalance in this distribution is a determining factor in different forms of malnutrition, such as obesity, and also in the emergence of other non-communicable diseases such as cardiovascular diseases and cerebrovascular disease.

It has been years since we were alerted that consuming trans fatty acids could have a negative association with health, and particularly with the abovementioned diseases. Since scientific studies began confirming this association, both food establishments and manufacturers started working to try and mitigate that risk. In Spain, Article 43 of the 2011 Law on Food Safety and Nutrition is dedicated to trans fatty acids, with the objective of minimising their content in foods in Spain.

Moreover, the food manufacturing and distribution and catering sectors also understood that the presence of unnatural trans fatty acids in foods could not be justified when their relationship with health was so obvious, and they also began to act accordingly.

This report highlights the great decrease in the presence of trans fatty acids in our food, and therefore, the convergence in the objective of improving the health of the public by the different social actors.

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SUMMARY AND CONCLUSIONS

Trans fatty acids, present in food mainly for technological reasons, are associated with various health problems such as heart disease and diabetes.

For many years, policies have been established to reduce TFA consumption, based on legislative measures, information campaigns, and food reformulation.

The fatty acid content was studied in 443 foods acquired in Spain in 2010. The TFA percentage of total fat was calculated.

The TFA percentage of total fat was lower than 2% in the vast majority of food groups. The few foods exceeding this level belong to dairy products, which contain natural TFA.

These results are consistent with those found in other studies carried out in Spain and in other countries.

The policies of reducing TFA consumption and the involvement of the food industry in the reformulation of its products seem to be key in the decrease of TFA content in foods.

In light of the results, the content of TFA in foods is not currently a public health issue in Spain.

However, it is necessary to maintain evaluation activities to regularly monitor TFA content in foods, through the Nutrition and Obesity Study Observatory.

INTRODUCTION

Trans fatty acids

Trans fatty acids (TFA) are unsaturated fatty acids (MUFA or PUFA) with one or more double bonds in the trans configuration. This configuration may exist both due to natural processes (which explains the natural presence of TFA in some foods, such as dairy products or meat) and through certain processes of catalytic hydrogenation of vegetable oils carried out in the food industry¹. Other processes, after the refining of vegetable or fish oils, or the heating and frying of oils at high temperatures also generate TFA².

The TFA obtained industrially from partially hydrogenated vegetable oils are associated with multiple pathologies and have adverse effects on the metabolism of fatty acids, inflammation processes, the endothelial function and blood lipids: increase in the concentration of LDL cholesterol and reduction of HDL cholesterol in blood, to a greater extent than saturated fats^{1,3}. The Expert Committee of the FAO/WHO has concluded that there is convincing evidence that these fatty acids are harmful to health, since they involve many cardiovascular risk factors and contribute considerably to increasing the risk of coronary heart disease⁴.

Trans fatty acids and health

Many studies have reported that TFA intake is related to an increase in coronary heart disease, sudden death due to cardiac causes, and diabetes, amongst other disorders. These associations are mediated by the effects that TFA have on the body, through the modification of lipid metabolism, the promotion of systemic inflammation, insulin resistance or endothelial dysfunction^{1,3,5-7}.

Trans fatty acids in foods

Once the potential risk involved in TFA intake in food was known, attempts were made, on one hand, to quantify TFA contained in food and, on the other, to seek ways of reducing intake. Some countries, such as Denmark, introduced strict legislative measures aimed at reducing the content of TFA in foods⁸. The same occurred in Spain. The 2001 Law on Food Safety and Nutrition introduced a specific article aimed at minimising the presence of unnatural TFA in foods⁹.

Furthermore, from that time on, not only institutional and information initiatives were introduced, but also initiatives from the food processing and distribution sectors.

It is important to evaluate whether TFA content in foods is still a major problem or whether, on the contrary, all of these initiatives have yielded their intended results. Evaluation and follow-up is a key axis within the NAOS Strategy, and of course, within the Nutrition and Obesity Study Observatory. As such, this study carried out from the information available in 2010 must be useful for gauging the situation.

OBJECTIVES

The main goals of this study are to:

1. Know the amount of TFA in foods in Spain in 2010.
2. Know the TFA percentage of the total fatty acids contained in foods in Spain.
3. Evaluate the trend in TFA content in foods in Spain.

METHODOLOGY

In 2010, the Spanish Agency for Consumer Affairs, Food Safety and Nutrition (AECOSAN) carried out a study regarding fat and sugar content in Spain. The complete study was not published, since its objective was for it to be used as an evaluation tool and not for dissemination. The results of the study were useful as a basis for establishing food reformulation targets and for establishing agreements with certain sectors of the food industry.

The study includes the lipid profiles of the foods analysed, and, therefore, the total fatty acid content: unsaturated fatty acids, saturated fatty acids and TFA.

In the study, 605 own-brand and private label brand products were acquired and analysed and were classified into groups or families. Data were obtained on fats in 443 of these products. The selection of products and their subsequent acquisition was carried out in accordance with market criteria after consulting reliable sources (Nielsen Spain and Alimarket). Products were bought from hypermarkets and supermarkets established all over Spain.

The laboratory tests for the fats were carried out by an independent laboratory through a gas chromatography procedure with a flame ionisation detector on food samples, certified by ENAC.

Central tendency (mean and median) and dispersion (standard deviation, minimum and maximum) estimators of the quantity of TFA in each food group were calculated, measured in g of TFA/100g of product. The TFA percentage of the total fats was calculated for each product. All calculations were also carried out for the different food groups or families.

RESULTS

The number and groups of products in which the fat content was analysed are displayed in Table 1.

Table 1. Foods analysed.

Type of food	Quantity
Microwave popcorn	10
Corn snacks	13
Custard	9
Dairy desserts (glasses)	9
Crème caramel	3
dairy desserts (creamy)	8
Flavoured yoghurts	10
Pizza and pizza bases	26
Cannelloni	9
Lasagne	10
Dehydrated soups	10
Cocoa powder	9
Chocolate drops	3
Chocolate bars	4
Chocolate eggs	4
Chocolate tablet bars	10
Breakfast cereals with chocolate	8
Cured chorizo	9
Chopped	8
Mortadella	8
Sausages	9
Infant foods	17
Full-fat spreadable cheese	10
Processed cheese	10
Handmade/homemade chips	10
Normal chips	10
Desserts and pastries for baking	18
Fast food (sandwich bar)	7
Fast food (hamburger bar)	8
Fast food (pizzeria)	5
Croissants	9
Cupcakes	9
Confectionery and cakes for children	7
Rich tea type biscuits	10
Toasted crackers	9
Filled biscuits	9
Industrial bread	20
Tomato sauce	17
Butter	10
Margarine	10
Ice-cream	39
Mayonnaise	10
Total	443

Table 2 displays the quantities of TFA g of TFA per 100g of product in the different groups.

Table 2. Quantity of TFA (g/100g of product) in foods.

Type of food	N	Mean	SD	Median	Minimum	Maximum
Custard	9	0.02	0.00	0.02	0.02	0.02
Dehydrated soup	10	0.02	0.00	0.02	0.02	0.02
Chocolate drops	3	0.02	0.00	0.02	0.02	0.02
Breakfast cereals with chocolate	8	0.02	0.00	0.02	0.02	0.02
Infant foods	17	0.02	0.00	0.02	0.02	0.02
Tomato sauce	17	0.02	0.00	0.02	0.02	0.02
Industrial bread	20	0.02	0.01	0.02	0.02	0.04
Ice-cream	39	0.03	0.01	0.02	0.02	0.05
Flan	3	0.03	0.02	0.02	0.02	0.05
Lasagne	10	0.03	0.01	0.03	0.02	0.04
Pizza and pizza bases	26	0.03	0.01	0.02	0.02	0.07
Mortadella	8	0.04	0.02	0.04	0.02	0.06
Fast food (sandwich bar)	7	0.04	0.03	0.02	0.02	0.11
Toasted crackers	9	0.04	0.02	0.04	0.02	0.07
Chopped	8	0.05	0.01	0.05	0.02	0.07
Handmade/homemade chips	10	0.05	0.02	0.05	0.02	0.08
Microwave popcorn	10	0.05	0.01	0.05	0.04	0.07
Cannelloni	9	0.05	0.02	0.05	0.02	0.08
Flavoured yoghurts	10	0.05	0.02	0.06	0.02	0.08
Rich tea type biscuits	10	0.05	0.03	0.06	0.02	0.09
Cocoa powder	9	0.06	0.01	0.06	0.04	0.08
Cupcakes	9	0.06	0.04	0.06	0.02	0.12
Chocolate bars	10	0.07	0.01	0.07	0.05	0.09
Sausages	9	0.07	0.02	0.07	0.04	0.09
Filled biscuits	9	0.08	0.02	0.07	0.05	0.11
Corn snacks	13	0.08	0.06	0.10	0.02	0.20
Cured chorizo	9	0.09	0.03	0.08	0.05	0.13
Petit dairy desserts (creamy)	8	0.09	0.06	0.08	0.05	0.25
Chocolate eggs	4	0.10	0.02	0.09	0.08	0.12
Desserts and pastries for baking	18	0.10	0.13	0.08	0.02	0.62
Dairy desserts (glasses)	9	0.11	0.03	0.11	0.05	0.14
chips	10	0.11	0.03	0.11	0.07	0.15
Croissants	9	0.12	0.02	0.12	0.09	0.14
Confectionery and cakes for children	7	0.21	0.26	0.11	0.07	0.80
Fast food (hamburger bar)	8	0.23	0.13	0.26	0.04	0.41
Margarine	10	0.25	0.13	0.26	0.08	0.44
Chocolate bars	4	0.26	0.06	0.27	0.17	0.31
Fast food (pizzeria)	5	0.27	0.23	0.19	0.10	0.67
Mayonnaise	10	0.44	0.16	0.41	0.27	0.72
Processed cheese	10	0.45	0.11	0.47	0.24	0.59
Full-fat spreadable cheese	10	0.54	0.12	0.53	0.38	0.74
Butter	10	1.84	0.30	1.88	1.22	2.28

TFA = trans fatty acids

SD = Standard Deviation

The proportion of TFA with respect to total fatty acids in each food group is displayed in Table 3.

Table 3. Proportion TFA/Total fats.

Type of food	N	Percentage
Chocolate drops	3	0.09
Handmade/homemade chips	10	0.14
Mortadella	8	0.17
Microwave popcorn	10	0.22
Chocolate bars	10	0.22
Cupcakes	9	0.25
Ice-cream	39	0.26
Chocolate eggs	4	0.30
Cured chorizo	9	0.31
Chips	10	0.32
Chopped	8	0.32
Sausages	9	0.34
Corn snacks	13	0.35
Filled biscuits	9	0.37
Lasagne	10	0.39
Margarine	10	0.41
Pizza and pizza base	26	0.42
Toasted crackers	9	0.43
Rich tea type biscuits	10	0.43
Croissants	9	0.44
Dehydrated soup	10	0.50
Custard	9	0.55
Tomato sauce	17	0.59
Fast food (sandwich bar)	7	0.60
Cannelloni	9	0.63
Mayonnaise	10	0.66
Industrial bread	20	0.66
Breakfast cereals with chocolate	8	0.67
Infant foods	17	0.70
Chocolate bars	4	0.95
Confectionery and cakes for children	7	1.03
Fast food (hamburger bar)	8	1.67
Desserts and pastries for baking	18	1.71
Cocoa powder	9	1.82
Crème Caramel	3	1.83
Dairy desserts (glasses)	9	2.14
Butter	10	2.27
Petit dairy desserts (creamy)	8	2.48
Full-fat spreadable cheese	10	2.52
Fast food (pizzeria)	5	2.57
Flavoured yoghurts	10	2.67
Processed cheese	10	2.72

TFA = Trans fatty acids

DISCUSSION

There were significant social and health concerns caused by the knowledge of an association between its consumption and its negative effects on health and this triggered a series of studies and interventions in different fields.

TFA in foods were found for technological reasons (partially hydrogenated fats) and not natural or nutritional reasons also meant that there was no objection to their reduction in products. As such, other legislative initiatives to reduce TFA content in foods in the United States in California and New York were added to Spanish initiatives, receiving great media coverage.

The first studies on TFA content in foods, which were carried out after their harmful effects on health were known, showed high levels in some groups. TFA content in foods is not homogeneous. Some groups with traditionally high TFA contents were margarine, industrial bakery products, hamburgers and chips¹⁰.

In Spain, in a study published in 2009 on previous research, some groups had very high TFA percentages of total fat, such as 36% in microwave popcorn or 20.9% in chips from burger restaurants, and there were levels above 3% in a very significant number of groups¹¹.

A subsequent study carried out by the National Food Centre (CNA) on a total of 99 products showed that percentages of TFA appeared to have decreased with respect to previous data¹².

The results of our study seem to confirm the finding in the CNA study. Almost all groups analysed have a TFA percentage (of total fat) lower than 2%. It is very important to highlight that those which exceeded 2% are almost all dairy products, which, along with meat, naturally contain a higher amount of TFA.

It is also important to highlight that in food groups traditionally related with a high TFA content, their content was minimal: the TFA percentage (of total fat) was 0.41% in margarine, 0.22 in microwave popcorn, 1.03% in confectionery and cakes for children and 1.67% in burger bar menus.

In general, in our results we observed that the total amounts of TFA per 100g of product are minimal in practically all foods analysed, and in some food groups they are practically non-existent.

The results are consistent, as we have already said, with those found in the CNA study, and also with other studies carried out on specific food groups and in certain autonomous communities^{13,14}.

The results found are consistent with the view that has prevailed for several years: that TFA in foods is decreasing. In this regard, food and drink manufacturers and distributors in Spain went to great lengths to make this need for reduction a reality. In this case, the food industry was aware of the social and health demand from the early stages and it responded effectively and conclusively, negotiating the technological problems that the challenge posed. We must also highlight the effort made to spread these reductions in TFA through nutritional labelling.

The policies for reducing TFA consumption were an indispensable foundation for increasing awareness about TFA-associated health problems and in the drive to lead the reduction initiatives carried out¹⁵⁻²⁰.

Our study was methodologically strong and it was also strong in terms of the large sample size of products analysed. The classification or division of the products into the most homogeneous groups possible is always difficult, but in this case, and given that no direct comparison with other results was necessary, it was preferred to have more subcategories even though their sample sizes were somewhat smaller. The result supports this decision and reinforces its validity.

The main conclusion that can be drawn from our study, which is furthermore consistent with other sources of information, is that the presence of TFA in our foods no longer represents a public health problem, since their quantities are very low.

It is necessary to regularly evaluate the content of TFA in foods, but we can be assured that, according to the current situation, it is very unlikely that there will be negative changes. The Nutrition and Obesity Study Observatory is an ideal tool for carrying out this evaluation.

Achieving this situation is something that all establishments and sectors involved in nutrition and health should be congratulated for, since it is an example of how collaboration between sectors can yield significant results that are manifested in the improved health of the population.

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