

Brief original article

# Trans-fatty acid content of food products in Spain in 2015



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## ARTICLE INFO

### Article history:

Received 26 February 2016

Accepted 5 April 2016

Available online 4 June 2016

### Keywords:

Trans-fatty acids  
Diet  
Food and nutrition  
Nutrition policy  
Reformulation  
Food quality  
Cardiovascular diseases

## ABSTRACT

**Objective:** To ascertain the content of trans-fatty acids (TFA) in food products in Spain in 2015 and assess trends in TFA content since 2010.

**Methods:** We analysed the fat content of 277 food products purchased in Spanish supermarkets in 2015 and calculated both the total fat and TFA content and the proportion of TFA to total fats. The results obtained in 2015 were compared to those yielded by a similar study in 2010.

**Results:** In 2015, the majority of food products studied had a TFA content of less than 0.2 g/100 g product, and a TFA/total fat ratio of less than 2%. No significant increases were found compared to 2010. Food groups with a higher TFA content were dairy products of possible natural origin.

**Conclusions:** TFA content in Spain is low and has significantly fallen since 2010.

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### Palabras clave:

Ácidos grasos trans  
Dieta  
Alimentos y nutrición  
Políticas de nutrición  
Reformulación  
Calidad de los alimentos  
Enfermedades cardiovasculares

## Contenido de ácidos grasos *trans* en los alimentos en España en 2015

### RESUMEN

**Objetivo:** Conocer el contenido de ácidos grasos *trans* en los alimentos en España en 2015 y evaluar la tendencia desde 2010.

**Métodos:** Se analizó la composición grasa de 277 alimentos adquiridos en supermercados en España en 2015. Se calcularon el contenido en ácidos grasos *trans* y en grasas totales, y el porcentaje de ácidos grasos *trans* respecto de la grasa total. Se compararon los resultados con los de un estudio similar realizado en 2010.

**Resultados:** En 2015 la mayoría de los alimentos estudiados tenían menos de 0,2 g de ácidos grasos *trans* por 100 g de producto, y menos del 2% de ácidos grasos *trans* respecto a las grasas totales. No se hallaron aumentos significativos desde 2010. Los grupos con contenidos más altos de ácidos grasos *trans* eran derivados lácteos, con posible origen natural.

**Conclusiones:** El contenido de ácidos grasos *trans* en España es bajo y se ha reducido significativamente desde 2010.

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## Introduction

Trans fatty acids (TFA) are unsaturated fatty acids with at least one double bond in the transconfiguration.<sup>1</sup> This configuration can come about naturally from ruminant-based meat and dairy products, or artificially through partial hydrogenation of vegetable oils in the food industry and manufacturing processes.<sup>1,2</sup>

There is scientific evidence to show that TFA intake is associated with cardiovascular diseases in different ways.<sup>3,4</sup> In addition, associations between TFA intake and other diseases, such as diabetes mellitus,<sup>1,3–5</sup> cancer<sup>6</sup> and asthma,<sup>7</sup> have also been proposed.

Due to those health risks, it is clear that TFA intake should be as low as possible, and that TFA content in food products should

be reduced or eliminated. Some countries have regulated TFA content, such as Denmark, by means of an Order which came into force in 2003.<sup>8</sup> In Spain, the 2011 Food Safety and Nutrition Act included a specific provision targeted at reducing artificial TFA in food products.<sup>9</sup>

Although an important decrease in TFA content and intake has been detected in some countries,<sup>10,11</sup> as a result of statutory regulation, health promotion actions and voluntary food-industry initiatives, more efforts are nevertheless called for.

The aim of this study was thus to ascertain the average TFA content of food products in Spain in 2015, and assess time trends in TFA content since 2010 when an earlier study was undertaken.<sup>10</sup>

## Methods

To assess the TFA content in Spain, food products were acquired from hypermarkets and supermarkets countrywide.

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**Table 1**  
Trans-fatty-acids and total fat content (g/100 g of product) of food products in Spain.

Food groups	N	TFA (g/100 g of product)				p <sup>a</sup>	Total fats (g/100 g of product)				p <sup>a</sup>
		2010		2015			2010		2015		
		Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Salty snacks	16	0.057	0.057	0.003	0.007	0.005	22.213	5.278	22.525	6.204	0.856
Confectionary and pastries	21	0.210	0.381	0.008	0.014	<0.001	27.629	12.935	24.276	3.953	0.079
Processed meats	29	0.056	0.037	0.051	0.029	0.332	21.572	7.463	20.472	9.312	0.381
Breakfast cereals and cereal bars	7	<0.001	0.000	<0.001	0.000	0.998	3.200	0.924	2.857	0.776	0.104
Chocolates and cocoa products	24	0.099	0.086	0.038	0.056	0.003	21.746	12.206	22.388	12.440	0.796
Biscuits	24	0.049	0.035	<0.001	0.000	<0.001	15.267	5.085	14.004	4.839	0.025
Ice creams	19	<0.001	0.000	0.025	0.058	0.067	11.937	3.852	12.305	3.513	0.888
Butter	7	1.927	0.228	2.011	0.209	0.176	81.814	2.078	82.029	0.706	0.735
Margarine	10	0.254	0.130	0.136	0.205	0.093	59.640	9.582	59.480	9.243	0.681
Industrial bread	11	<0.001	0.000	<0.001	0.000	0.997	3.509	1.127	3.045	0.962	0.091
Chips	16	0.071	0.056	0.030	0.089	0.049	33.975	2.884	34.531	2.402	0.660
Ready meals	23	0.013	0.023	0.023	0.043	0.218	8.352	2.502	7.752	1.984	0.236
Products of fast-food restaurants	13	0.196	0.200	0.127	0.220	0.241	10.538	4.822	7.862	4.074	0.236
Spreadable cheeses	12	0.522	0.095	0.536	0.181	0.790	20.417	4.784	21.358	4.728	0.238
Tomato sauce	13	<0.001	0.000	<0.001	0.000	0.999	3.531	0.588	3.692	0.621	0.181
Yoghourts and dairy products	32	0.055	0.055	0.073	0.039	0.074	3.544	2.194	3.178	1.585	0.046

SD: Standard deviation; TFA: trans fatty acids.

<sup>a</sup> p for differences between means from 2010 to 2015.

The most sold food items in each group were selected for a previous study conducted by the Spanish Agency for Consumer Affairs, Food Safety and Nutrition (*Agencia Española de Consumo, Seguridad Alimentaria y Nutrición/AECOSAN*) in 2010.<sup>10</sup> We selected the same products for the purposes of our study, in order to compare TFA content between 2010 and 2015. The methodology used in both the 2010 and 2015 studies was similar.

We measured total fat and TFA content in the selected food items (g/100 g of product). Analytical tests were performed by an independent laboratory accredited by the Spanish National Accreditation Board (*Entidad Nacional de Acreditación/ENAC*), using gas chromatography with a flame ionization detector for food samples.

Mean and standard deviation were computed for TFA and total fat content in each group of food items. The TFA/total fat ratio was also calculated for each food product and group.

To assess the differences between 2010 and 2015, we compared the mean TFA values (g/100 g of product) and TFA/total

fat percentage ratios for those years using the U Mann-Whitney test.

In any case where there was no exact match between 2010 and 2015, the product concerned was excluded from the analysis to ensure the comparability of all groups.

## Results

Based on the 2010 study, a set of 443 food items was initially selected.<sup>10</sup> After the excluding all items that failed to show a match between 2010 and 2015, a total of 277 products was finally analyzed and grouped (Table 1).

In 2015, the average TFA content was less than 0.2 g/100 g of product across all food groups, with only two exceptions (butter: 2.011 g; spreadable cheeses: 0.536 g). TFA were undetectable in several groups, such as breakfast cereals, biscuits, industrial bread and tomato sauce. Comparison against the 2010 results showed reductions in TFA content in most groups, with some

**Table 2**  
Average proportion of trans-fatty-acids/total fats in food products in Spain.

Food groups	N	2010		2015		p <sup>a</sup>
		TFA/total fats	SD	TFA/total fats	SD	
Salty snacks	16	0.231	0.216	0.011	0.023	0.001
Confectionary and pastries	21	0.657	0.836	0.034	0.055	<0.001
Processed meats	29	0.248	0.147	0.248	0.068	0.673
Breakfast cereals and cereal bars	7	0.034	0.010	0.037	0.011	0.345
Chocolates and cocoa products	24	0.721	0.707	0.140	0.208	<0.001
Biscuits	24	0.311	0.238	0.008	0.003	<0.001
Ice creams	19	0.010	0.005	0.271	0.715	0.061
Butter	7	2.356	0.282	2.452	0.252	0.176
Margarine	10	0.413	0.183	0.274	0.466	0.093
Industrial bread	11	0.031	0.008	0.035	0.008	0.091
Chips	16	0.210	0.168	0.088	0.267	0.020
Ready meals	23	0.131	0.231	0.307	0.583	0.638
Products of fast-food restaurants	13	1.609	1.870	1.959	4.477	0.382
Spreadable cheeses	12	2.646	0.540	2.524	0.709	0.814
Tomato sauce	13	0.029	0.005	0.028	0.004	0.182
Yoghourts and dairy products	32	1.656	1.297	2.297	0.465	0.064

SD: standard deviation; TFA: trans fatty acids.

<sup>a</sup> p for differences between means from 2010 to 2015.

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