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Original

Micronutrient recommendations and policies in Spain; the cases of iodine, folic acid and vitamin D

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Abstract

Introducción: **As part of the work carried out within the EURopean micronutrient RECommendations Aligned (EURRECA) Network of Excellence in Spain, we conducted a series of semi-structured interviews with decision makers and relevant scientific institutions in the field of nutrition and public health. The information gathered was collated with national relevant official and unofficial documents and subsequently analysed.**

Aim: **To describe the current situation about nutrition policy in Spain, with special focus on the process of setting micronutrient recommendations and the development of subsequent policies. 3 cases will be detailed: iodine, folic acid and vitamin D.**

Methods: **Information from 9 interviews was contrasted with the available official and unofficial documents on micronutrients recommendations setting and subsequent policy applications to help the population to achieve their requirements.**

Results and discussion: **Common topics and themes were identified in the interviews and desk research. They describe a heterogenic picture of isolated initiatives and timid measures regarding micronutrients recommendations and subsequent policy instruments. Several recommendations coexist but none of them is the result of an official request by the government or competent authority. Iodine, folic acid and vitamin D represent the past, the present and the future of public health policy measures on micronutrients in Spain. Despite of some examples, there exist a need for action.**

Conclusions: **Current nutrition strategies are focused on obesity, with little room for micronutrients national measures despite of the opinion of many experts. Regardless of the several nutrients recommendations coexisting nowadays in Spain, there exist the need for a coordinated action in the field of micronutrients recommendations, fostered by the health and nutrition official authorities with financial support and clear terms of reference.**

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RECOMENDACIONES Y POLÍTICAS DE MICRONUTRIENTES EN ESPAÑA; EL CASO DEL YODO, ÁCIDO FÓLICO Y LA VITAMINA D

Resumen

Introducción: **Como parte del trabajo realizado dentro de la Red de Excelencia EURRECA (EURopean micronutrient RECommendations Aligned) en España, realizamos una serie de entrevistas semi-estructuradas con pensadores e instituciones científicas relevantes en el campo de la nutrición y la salud pública. La información obtenida se cotejó con documentos relevantes nacionales, oficiales y no oficiales, y analizada subsiguientemente.**

Objetivo: **Describir la situación actual de las políticas en nutrición en España, con un interés especial en el proceso de establecer las recomendaciones de micronutrientes y el desarrollo de las políticas subsiguientes. Se detallarán 3 casos: el yodo, el ácido fólico y la vitamina D.**

Métodos: **La información procedente de 9 entrevistas se contrastó con los documentos oficiales y no oficiales disponibles sobre recomendaciones sobre micronutrientes y las aplicaciones de las políticas subsiguientes para ayudar a la población a alcanzar los requerimientos.**

Resultados y discusión: **En las entrevistas y la investigación de despacho se identificaron temas comunes. Describían un cuadro heterogéneo de iniciativas aisladas y medidas tímidas concernientes a las recomendaciones sobre micronutrientes y los instrumentos políticos subsiguientes. Coexisten diversas recomendaciones pero ninguna de ellas es el resultado de una petición oficial gubernamental o de la autoridad competente. El yodo, el ácido fólico y la vitamina D representan el pasado, el presente y el futuro de las medidas de salud pública sobre micronutrientes en España. Con la salvedad de algunos ejemplos, existe la necesidad de actuar.**

Conclusiones: **Las estrategias actuales en nutrición están focalizadas en la obesidad, con poco espacio para las medidas nacionales en micronutrientes a pesar de la opinión de muchos expertos. Independientemente de las diversas recomendaciones que coexisten hoy en día en España, existe la necesidad de una acción coordinada en el campo de las recomendaciones sobre los micronutrientes, amparada por las autoridades oficiales en nutrición y con apoyo económico y unos términos claros de referencia.**

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Palabras clave: *Micronutrientes. Requerimientos nutricionales. Política nutricional. Guías de planificación sanitaria.*

Introduction

The EURopean micronutrient RECommendations Aligned (EURRECA) Network of Excellence has the overall mission to overcome fragmentation and create a sustainable collaborative network to develop quality assured aligned nutrient recommendations across Europe. As part of the work carried out within this project in Spain, we conducted a series of semi-structured interviews with decision makers and relevant scientific institutions in the field of nutrition and public health. The information gathered was collated with national relevant official and unofficial documents and subsequently analysed. This procedure was also followed in several other European countries. The objective was to research in the process of setting national micronutrients recommendations and the subsequent policy instruments related. Special regard was given to three examples: iodine, folic acid and vitamin D. The findings will be used to produce guidelines and instruments to assist the process of policy decision making and how best to integrate the scientific evidence from micronutrient recommendations with other evidence bases. These guidelines and best practices will be published soon by EURRECA. Meanwhile, here we present our findings for the Spanish case.

This work is based on the desk research, interviews and data analysis carried out, as part of the EURopean micronutrient RECommendations Aligned (EURRECA) Network of Excellence, Integration Activity 1 (IA1) and Research Activity 4.3 (RA4.3).

Aim

The purpose of this article is to describe the current situation about nutrition policy in Spain, with special focus on the process of setting micronutrient recommendations and the development of subsequent policies. Three examples, in line with EURRECA priority micronutrients, will be depicted to provide deep understanding of the process: the case of iodine, folic acid and vitamin D.

Methods

Interviews

A total number of 10 interviews were conducted in two different rows. They include relevant experts from the world of science who have participated in the development of micronutrient recommendations as well as policy makers and civil servants working in nutrition policy. Preliminary contact was also made with members of the industry and consumer associations. An interview carried out with a member of the salt industry regarding iodination of salt resulted very instructive but hardly relevant for the purpose of this research.

Table I
Interviewees by organisation group

Organisation group	*First row of interviews*	*Second row of interviews*
Scientific associations/ expert committee	1	2
Independent experts/University	1	1
Public Health department at Regional Governments	1	
Spanish agency of food safety and nutrition (AESAN)	2	
Public Health DG-Ministry of Health, social policy and equality	1	

A first row of interviews extracted information on the decision making process of developing micronutrients and food related policies, with special focus on iodine, folic acid and vitamin D. It also looked at how policy decision makers develop their work. The second row of interviews was intended to gather information from prominent individuals in the process of requesting, setting and communicating micronutrients recommendations to the policy making sphere, with especial focus on folic acid and vitamin D. A description of the sample is detailed in table I.

The questionnaires used in the interviews were equal in all the participant countries. The information was organised by common themes among the interviews and collated with that other information from the desk research.

Desk research

Different strategies were used in order to gather all the relevant information. Firstly we searched for information and publications in official websites as well as in those from the main scientific societies and industrial organisations working in food/nutrition. A list of relevant websites consulted is detailed in table II.

Expert consultation was also a fruitful source of information. A third method used to gather all the potentially important documents was reference hand search within the main documents, reviews and books previously located. Searching in Pubmed database did not yield new relevant titles.

Any document related to micronutrients recommendations setting and subsequent policy applications was searched. It must be stated that there exist a lack of official national-government documents on the process used to manage scientific information in relation to establishing nutrient recommendations and nutrient policies. It makes seeking for relevant documents a difficult task. So by applying this 3 steps desk research strategy the risk of leaving out any core publication was minimised.

Table II
Relevant websites

Spanish agency of food safety and nutrition (AESAN)	www.aesan.msc.es
Ministry of health, social policy and equality	www.msps.es
Complutense University of Madrid (UCM)	www.ucm.es
Spanish Society of Endocrinology and Nutrition (SEEN)	www.seen.es
Spanish Nutrition Foundation (FEN)	www.fen.org.es
Spanish Society for Dietetics and Food Sciences (SEDCA)	www.nutricion.org
Spanish Nutrition Society (SEN)	www.sennutricion.org
Spanish Society of Community Nutrition (SENC)	www.nutricioncomunitaria.com
Spanish Society of Parenteral and Enteral Nutrition (SENPE)	www.senpe.com
Spanish Federation of Nutrition, Dietetics and Food Societies (FESNAD)	www.fesnad.org
Federation of Food and Beverage Industries (FIAB)	www.fiab.es

Results and discussion

Nutrition policy in Spain. In brief

In Spain, nutrition is ruled under the area of Public Health. The distribution of competencies and regulatory capacity into centralised and decentralised institutions make Public Health to be disseminated between the national and regional levels. Thus, the body responsible at the national level is the Ministry of Health and Consumption via the Spanish Agency for Food Safety and Nutrition (AESAN), whilst at the regional level are the public health authorities within the Autonomous Communities. The result is a fragmented group of guidelines and strategies among regions, which in general has been just supervised at the national level, failing to attempt a nationally coordinated strategy. Moreover, nutrition in Spain receives little attention from the Public Health sector, compared to other European countries, and this seems to be a regional trend since no European Mediterranean country has historically have a formal nutrition policy at the national level (except for Malta).[1]

In the decade of 1960 was established the *EDALNU Program* by the Spanish Government, FAO and UNICEF. This program developed food consumption surveys and established a classification of foods in 7 groups represented as a wheel. Later, in the decade of 1980, the Ministries of Health and Agriculture, regional governments and research institution have conducted activities such as food availability surveys and dietary intake assessments. Also, they have developed recommendations, dietary guidelines and campaigns to establish healthy dietary habits and lifestyles in the population. All this activities have raised awareness on recent changes in diet and life style for the Spanish population, with high fat intake and an increase in obesity rates in children, adolescents and adults.[2] In order to tackle this situation of high prevalence of obesity, in 2005 the Ministry of Health and Consumption presented the *NAOS strategy*, a national plan designed to prevent obesity by means of the improvement of dietary habits and the promotion of physical activity.[3] The approach was multidisciplinary, involving many stakeholders in the planning and implementation of a wide range of actions, with a special focus on children and adolescents as studies showed a tendency to an increase in overweight and obesity in these groups in the last decades.[4]

NAOS implemented a wide range and active involvement of stakeholders in different areas, targeting actions in communities and families, schools, the industry, the health system and also the creation of an observatory of obesity.[5] It is remarkable that AESAN main activity before 2005 was related to food safety. Moreover, it has been argued in the interviews conducted as part of our research that the authorities' efforts nowadays are mainly focused on obesity (nation and regionally), with little room for other initiatives in the area of nutrition policy. Hence, apart from NAOS strategy, the current nutrition policy in Spain has not changed drastically regarding fragmentation and necessity of nation wide coordinated actions. It is therefore the case of policies concerning micronutrients, with a lack of official national-government documents on the process of establishing nutrient recommendations and nutrient policies, as well as how scientific information is used in these processes, when existing.

Nutrients and micronutrients recommendations

Two main characteristics define the nutrition recommendations in Spain, one being the consequence of the other: on the one hand the atomisation of efforts in many institutions (scientific) without an integrated approach, and on the other a lack of Government initiative in the form of official requests for recommendations setting regarding nutrients and micronutrients. As a result there exist several recommendations elaborated in parallel, and isolated from the government, by different scientific societies and universities.

The scientific community has played a capital role acting as advisory boards and always providing scientific evidence. Many of their reports and guides are available at governmental official sites (e.g. AESAN). Beyond from that, they have taken the initiative to develop nutrient recommendations. The motivation to undertake this work by their own, as stated by members of these organisations to this research, can be summarised as:

- International context. Many countries have been setting and updating their recommendations for

Table III
Nutrient recommendations available in Spain

Recommendation	*Institution responsible*
Moreiras O, Carbajal Á, Cabrera L, Cuadrado C. Tablas de composición de alimentos. Ediciones Pirámide S.A. 15ª edición. Madrid. 2011[7]	Complutense University of Madrid
Ortega RM. La Composición de los alimentos: herramienta básica para la valoración nutricional. Editorial Complutense. Madrid. 2004[8]	Complutense University of Madrid
Serra Majem L, Aranceta J, on behalf of the SENC working group on Nutritional Objectives for the Spanish Population. Nutritional Objectives for the Spanish Population: Consensus from the Spanish Society of Community Nutrition. *Public Health Nutrition* 2001; 4 (6A): 1409-1413[9]	Spanish Society for Community Nutrition (SENC)
Martínez A, Cuervo M, Baladia E et al. Ingestas dietéticas de referencia (IDR) para la población española. Madrid, Federación Española de Sociedades de Nutrición, Alimentación y Dietética. 2010[10]	Spanish Federation of Nutrition Societies (FESNAD)

many years, so action was perceived as necessary in Spain too.
- There was evidence about the deterioration of the Spanish population dietetic profile coming from epidemiologic studies.
- Self motivation and core interest. A need to have recommendations for research, education and public health campaigning purposes.

Consequently, several documents proposing recommended intakes of energy and nutrients coexist. In general, the concept of recommended intake, as used in the different tables of recommendations, corresponds to *Recommended Dietary Allowance*, one of the four levels of *Dietary Reference Intakes* (DRI) as defined by the USA Institute of Medicine, or to the *Recommended Nutrient Intakes* used in the UK.[6] A list of the different recommendations available is shown in table III[(1)].

The first document containing information on recommended intakes dates from 1971 (Varela G, García D, Moreiras O. La nutrición de los españoles. Diagnóstico y recomendaciones. Instituto de Desarrollo Económico. Madrid. 1971),[11] but it is in 1985 when the first Spanish recommendations are published by the Department of Nutrition at the Complutense University of Madrid (UCM) by the same author.[12] In addition to nutrient recommendations, containing reference values for micronutrients, the document included large food composition tables. It has been reviewed and expanded several times, in 1998 and later in 2006, with the 15th and last edition published in 2011.[7] Also from the Department of Nutrition at UCM, another set of energy and nutrients recommendations has been developed for research and educational purposes by Ortega RM et al., 1994 and updated in 2004[8] and 2009. Although coming from the same institution, these two sets of recommendations differ from each other in the segmentation of the population groups and values for some nutrients as iodine, vitamin D and folate.

Moreover, different scientific societies have developed their own recommendations. A remarkable effort corresponds to the Spanish Society of Community Nutrition (SENC), who published a consensus document on dietary guidelines for the Spanish population (1995)[13] including *nutritional objectives* specific for Spain (values for iodine and folate are included but not for vitamin D). It was the first time that Food Based Dietary Guidelines in the form of a pyramid were adapted to the Spanish population. An update of this consensus document was released in 2001.[9] It was an open and including process with the participation of more than 100 experts and professionals from different sectors.

Recently, the Spanish Federation of Nutrition, Dietetics and Food Societies (FESNAD) set an expert committee to coordinate the transition from the traditional recommended intakes to the broader concept of Dietary Reference Intakes (DRI) for the Spanish population.[14] The DRI comprise up to four different values for different uses: *Recommended Dietary Allowances, Adequate Intakes, Estimated Average Requirements, Tolerable Upper Intake Levels*. The first step of this process (out of three) has been published in 2010.[10] The publication constitutes an important attempt to coordinate the atomised expertise previously existing. Nevertheless the DRI proposed in this document have been criticised due to the methodology used in the process.

None of the initiatives explained above has been the result of an official request by the government or competent authority. They have arisen from the effort of motivated institutions and experts working in the field of nutrition and public health.

Legislation for labelling

The recommended nutrient reference values for the labelling of foods were established by the Real Decreto

(1) Some other recommendations were found, for example by SEDCA. We decided to exclude it, as no specifications for data neither for methodology were given. http://www.nutricion.org/recursos_y_utilidades/necesid_nutrientes.htm

1669/2009.[15] It incorporates to the Spanish legislation the Directive 2008/100/EC of 28 October 2008 which amends Council Directive 90/496/EEC on nutrition labelling for foodstuffs as regards recommended daily allowances, energy conversion factors and definitions. The latter had been transposed to a national norm by Real Decreto 930/1992[16] on food labelling, therefore the purpose of RD 1669/2009 was, among others, updating the values for minerals and vitamins recommended daily allowances as requested by the EC legislation, for the sake of the equal and effective functioning of the European internal market.

Reviewing the process of establishing recommendations

When analysing carefully the different recommendations coexisting in Spain, it can be found that in some occasions the data and methodology used in the process of establishing the values for intakes is not clearly explained.[10] In the same way, it has been stated in our interviews that in some cases they are the opinion of a group of experts at the light of the international publications and the available national data, when it exists. In the following paragraphs we will look more closely to those recommendations where a more clear explanation of the methodology used is provided.

The process of establishing *Nutritional objectives* and food based dietary guidelines, is well explained in the consensus document published in 2001 by SENC.[9,17] In brief, consumption analysis of macro and micro nutrients utilising data from the principal nutrition studies conducted in Spain allowed for quantification of the value corresponding to the 75th percentile for nutrients targeted for increased intake. For nutrients for which intakes were to be reduced, 25th percentile was applied. These values constituted *intermediate nutritional objectives* which reflected reachable goals given that 25% of the Spanish population was already meeting the nutrient objectives. *Final nutritional objectives*, long term goals, were based on available scientific evidence within the context of the EURODIET project and incorporated adaptations that reflected the Mediterranean reality and idiosyncrasy in Spain. The document included nutritional objectives for iodine, folic acid, calcium, sodium and fluoride, based on the Recommended Nutrient Intake values (RNI) available in the international literature. No value for vitamin D was included, perhaps because as reflected in some interviews, awareness of the necessity of action regarding vitamin D is more recent than in the cases of iodine and folic acid.

The methodology used by the expert committee set by the Spanish federation of nutrition, dietetics and food societies (FESNAD) for establishing Dietary Reference Intakes for the Spanish population, is well explained in the publication "Ingestas Dietéticas de Referencia (IDR) para la población española" (Ediciones EUNSA, Navarra) published in 2010.[10] This publication corresponds to the first step of a process of 3, overall consisting in:

1. Compilation of well documented DRIs from different international institutions (OMS, FAO, IOM/EEUU and different EU countries) and adapt them to the Spanish population.
2. Compilation of methodologies and data from Spanish studies.
3. Elaboration of Spanish IDR, by means of completing data from international studies with Spanish studies. When possible calculating DRI from Spanish data exclusively.

The document justifies the methodology used by arguing that the process for establishing DRI in the countries reviewed is not based exclusively in data from the own country or areas geographically close. For instance studies used by the Food and Nutrition Board-Institute of Medicine (FNB-IOM) to establish DRI for the USA population are based in USA population studies as well as in British, Dutch, Swedish and Australian ones. This, added to a lack of sufficient studies from Spain, make in the view of the authors the American FBM-IOM and some other recommendations to be suitable for the Spanish population. So, for vitamins and minerals, chosen DRIs were based in values from other countries when they were backed by scientific evidence, and when not, directly taken from the FNB-IOM values. For pregnant woman also values from the Spanish recommendations by Moreiras and col. were taken for several micronutrients.

Several experts interviewed observed this procedure questionable and not in line with the criteria developed by EURRECA for the establishment of micronutrient recommendations, therefore methodologically poor.

In conclusion, there exist an urgent need for coordinated action in the field of micronutrient recommendations, fostered by the health and nutrition official authorities with financial support and clear terms of reference (in line with responses from interviewees). Nutritional objectives set by SENC in 2001 can be worth to note.[18] The proposal from FESNAD encompasses some of previously stated requirements, however there are important criticisms regarding the methodology employed.

Key messages from key stakeholders: the value of interviews

From the detailed analysis of the interviews conducted, themes and topics common to several interviewees were identified. All together, they account for an accurate description of the current situation regarding nutrition policy, the process of setting up recommendation and the use of this information for

policy purposes. The value of this information is on the long experience of those selected and interviewed as they are prominent actors in the Spanish nutrition field, participating in nutrition research, public education and policy development for many years. In the case of Spain, it is especially important since micronutrient policy is not well developed, with a remarkable absence of official documents on the request of micronutrient recommendations, deliberations during the process of establishing them or the development of policies in this area.

Common themes and quotes extracted from the interviews sustain the situation described above and also the case studies for iodine, folic acid and vitamin D in the next section.

From recommendations to policy (or vice versa). The case of iodine, folic acid and vitamin D

"These examples are very good ones because iodine is water under the bridge, folic acid is the present, a today's issue,. And vitamin D is the forthcoming future"

Interviewee reflection on micronutrient policies in Spain.

The case of Iodine

According to WHO, dietary deficiency of iodine is one of the most frequent nutritional causes of preventable impaired cognitive development. Important conditions associated to this deficiency are goitre and cretinism. Also mild iodine deficiencies in pregnant women are associated with problems in the periconceptional period as well as hearing and cognitive deficiencies in children.[19]

In Spain, Iodine deficiency disorders (IDD) have decreased from a widespread situation in the previous decades.[20] IDD is a well recognised problem. Scientific societies are striving for the eradication of the problems associated to these disorders. For instance, the Spanish society of endocrinology and nutrition (SEEN) has created a working group for IDD[(2)] who has been developing educational materials and creating awareness for more than 25 years.

In line with WHO and the International Council for the Control of Iodine Deficiency Disorders opinions, SEEN has stated that the solution is as easy as the use of Iodine fortified salt for meal preparation. They advocate for a Universal Salt Iodination (USI), meaning that any salt for human or animal use, including the food industry, should be iodinated.[21] In Spain USI has not been adopted as a general strategy, nevertheless:

- Legislation. In 1983 a decree (Real Decreto 1424/1983 27th of April) was approved on the addition of 60mg of Iodine per Kilogram of salt. However, the scientific associations and foundations have criticized the government because of the lack of campaign efforts for the promotion of use of Iodinated salt.
- OMS classifies Spain as in optimal Iodine nutrition condition,[22] but there are big differences among autonomous communities. Some regional governments have regulated a compulsory use of iodine fortified salt in schools (Asturias, Galicia), making endemic goitre to disappear.[23]
- Educational campaigns. Systematic educational campaigns in the Basque Country have increased very significantly the intake in the population via consumption of fortified salt. Also the use of iodinated salt at school is recommended in NAOS strategy.
- Iodine supplementation is subsidised by the national health system under medical prescription[(3)]. There exist higher intake requirements during pregnancy and lactation, making difficult to achieve a sufficient intake through the diet. This responsibility in the hands of practitioners.

Even though the first actions to overcome IDD date from the early eighties, isolated actions to encourage the use of iodinated salt do not suffice. There is a need for public health measures to eradicate irreversibly these problems from the Spanish population.[21]

The value of interviews

Insights from the interviews conducted as part of our research can help to contextualise the policies on Iodine (table IV).

The case of folic acid

According to the Spanish dietary assessment by the Food Consumption Panel, the average energy and nutrient intake excesses 80% of the recommended value except for zinc and **folic acid** in men and women between 20-39 years old.[24]

In Spain, intake recommendations for Folic Acid are based on the prevention of megaloblastic anaemia. Folic acid deficiency during pregnancy is a major cause for baby neural tube defects; therefore a good folic acid status is important in the periconceptional period, especially before and during the first three months of pregnancy. Therefore some studies encourage to disseminating appropriate guidelines not only among gynecologists but also among family and

[(2)] The group changed name in 2010 to *Working Group for Iodine Deficiency and Thyroid Dysfunction*. http://www.seen.es/index.html?anterior=http://www.seen.es/endocrinologia/grupos-yodo.html

[(3)] It is also the case of other micronutrients, especially folate during the periconceptional period, but also vitamin D.

Table IV
Insights from the interviews to contextualise the policies on iodine

The process of setting policy options: deliberations during the process. (Context: during the early years of decree 1424/1983 27th of April)	"It was considered to make obligatory the use of salt with iodine but the idea was abandoned because it can cause thyrotoxicosis in some patients"
The process of setting policy options: (Context: during the early years of decree 1424/1983 27th of April)	"It was important to see if the consumer would choose iodinated salt from the shelter (...). Distribution studies were done"
Stakeholders' concerns on salt fortification.	"Groups on hypertension were not keen on using the salt as the vehicle for iodine. It looked like an increase in salt consumption could be apropitiated, they were worried and made a racket" (...) [Finally] there was no impact in salt consumption; rather it has decreased systematically in the last years in Spain"
Policy action in iodine is the most clearly represented in Spain, regarding micronutrients	"It is the clearer and more documented process we have at national level"

Table V
Insights from the interviews to contextualise the policies on folic acid

Disagreement regarding the need for action: nutrition authorities *vs.* scientific institutions.	"regarding vitamin D and folate, perhaps our studies have not shown that there exist a need for action about deficiencies as strong as to deserve a strategic line in our nutritional policy" *Vs.* "In folate and vitamin D there is tiny done" "I would say vitamin D is a priority for public health nowadays. And folate, of course"
Lack of action by authorities regarding policy instruments.	"In Spain [action regarding folate supplements] it has been led by professional societies, the gynaecology, ¿ok? paediatrics also, in other words, it has not been steered by any official mean"
Preference for "soft" policy instruments by the authorities.	"[advice on folic acid supplementation for childbearing age woman] it is a matter of inclusion in medical protocols. If so, then a law is not necessary; regulation is not necessary"
Scientific uncertainty conditioned the process of setting up folic acid recommendations (nutritional objectives by SENC, 1995 and 2001).	"There was uncertainty especially in the efficacy/safety relationship … folic acid could hide vitamin B12 deficiency. If we were reticent was to avoid any problem later"
Other kinds of uncertainty affected the process from recommendations to policy. (Context: Consensus from the Spanish Society of Community Nutrition, 2001).	"We'd have liked flour fortification with folic acid as a public health experience ... but the flour business was afraid because the government was reluctant to take any responsibility... so fortification now is more a marketing strategy than a public health measure"

general practitioners and health professionals working at family planning centers.[25]

Folic acid importance in the prevention of cardiovascular diseases, cancer and other neurodegenerative diseases are also factors to encourage an increased intake in the population.

- The authorities in several countries have adopted different norms related to folic acid, fortifying staple food such as dairy products or cereals. Mandatory fortification is preferred in some countries (USA, Canada or Chile) while voluntary fortification of products by the industry is chosen in most of the European countries, including Spain.[26,27]
- Educational documents, food based dietary guidelines, encourage the consumption of foods which contain folic acid during pregnancy (400 μg/day).[28]
- Folic acid supplementation is subsidised by the national health system under medical prescription. Medical doctors encourage the use of supplements in target groups at risk of deficiency (women at childbearing age, pregnant/lactating woman, and elderly people).

The value of interviews

Insights from the interviews conducted as part of our research can help to contextualise the policies on folic acid (table V).

Table VI
Insights from the interviews to contextualise the policies on vitamin D

Disagreement regarding the need for action: nutrition authorities *vs.* scientific institutions.	"regarding vitamin D and folate, perhaps our studies have not shown that there exist a need for action about deficiencies as strong as to deserve a strategic line of our nutritional policy" *Vs.* "vitamin D is a topic where we have to push action because is a very vulnerable nutrient and also it is seen that fortification policies provide many benefits to the population" "I would say vitamin D is a priority for public health nowadays (…)"
Good practices in the skimmed products industry play an important role.	"…as in other countries when the industry produces skimmed products, it is normally enriched with vitamin E and D because these vitamins go away with the fat. they are automatically enriched (...) industry codes of good practices"
Some think vitamin D fortified products should be facilitated in order to be reachable in the market for disadvantaged groups. (Context: nutrition problems seen as a public health issue related to social inequality)	"Consumers association are rather far away, there is no influence, why there are not more vitamin D products in the market, cheaper so can be given to disadvantaged groups? It is important because nutrition can be seen also as a social inequality issue"

The case of vitamin D

In Spain, during the period 2000-2006 the relation Calcium/vitamin D intake for the population between 20 and 39 years old has been less than the recommended. As skin efficacy to synthesise this vitamin decreases in the old age, dietary intake is critical. In addition, the Survey in Europe on Nutrition and the Elderly: a Concerted Action (SENECA), showed that more than 50% of the sample studied in Spain was below the recommended intake for vitamin D (and several other micronutrients).[29] Low levels of vitamin D and calcium have been detected in children, leading to cases of rachitis, in spite of theoretical good levels of sun exposure in the country.[30]

Low vitamin D diets have an influence in the two most common types of osteoporosis (Type I in postmenopausal women and Type II in the elderly 70y+) in Spain.[30] Likewise, it has been argued that a preventive use of vitamin D could half colon cancer cases.[31]

- Recommendations to raise the intake of foods rich in vitamin D for pregnant woman and elderly people can be found in different documents and websites. It is especially mentioned in food based dietary guidelines available for the public.[28]
- Fortification of Skimmed products with vitamin D and other liposoluble vitamins is quite common as good practices for the industry. Like in the case of folic acid, in Spain fortification is voluntary.[27]
- Supplementation subsidised by the national health system under medical prescription is also possible for groups at risk of Vitamin D deficiency. Osteoporosis associations are behind the raise in awareness on this issue.

The value of interviews

Insights from the interviews will be especially helpful to understand the vitamin D context, since the situation is of very little policy measures development (table VI).

Conclusions

- There are very few policy actions regarding micronutrients in Spain. Iodine is the most documented example, with some important measures as legislative policy instrument. Efforts are nowadays in Obesity, with little room for other integrated strategies, despite of the opinion of scientific societies and public health experts.
- There exist several recommendations elaborated in parallel, and isolated from the government, by different scientific associations and universities. Data and methodologies used are not always clear.
- Anyway, it is a shared opinion that there is a need for an integrated, government supported process of nutrient and micronutrient recommendations development[31]. In the view of some interviewees, EURRECA will set the best practices for this task.
- "Soft" policy actions seem preferred to "hard" ones. An example is voluntary fortification preferred to obligatory measures. It is in line with the situation in other European countries.[27] Also, it is considered as part of the so-called Mediterranean idiosyncrasy.[1] Uncertainties in the evidence and loose leadership by the government have also prevented policy actions regarding micronutrients.

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