FEN
SPANISH NUTRITION FOUNDATION

NUMBER 7

ANIBES

Macronutrient Distribution and Dietary Sources in the Spanish Population: Findings from the ANIBES Study

With the participation of:

Spanish Nutrition and Food Sciences Academy (AEN)

Spanish Nutrition Society (SEN)

Spanish Society of Community Nutrition (SENC)

Spanish Foundation for Nutritional Research (FIN)

Nutrition Studies Association (ASEN)

Improvement of Health by Fitness, Nutrition and Exercise Research Group

ANIBES

NUMBER 7

Macronutrient Distribution and Dietary Sources in the Spanish Population: Findings from the ANIBES Study

Introduction

Deep social and economic changes occurred in our country in the last few decades, which also experienced a transition in dietary patterns and lifestyles.

Some of these changes have had a potentially positive impact, such as increasing the variety of foods, access and food safety. However, globally, these changes are contradictory with adequate food selection and adherence for a healthy Mediterranean diet.

Knowing macronutrient intake provides a way to examine eating patterns and their impact on calorie and nutrient intakes across different populations.

This research within the ANIBES study focuses on macronutrient intake in the diet of the sample participating in the study. In this way, the main aim was to better characterize the macronutrient excess or inadequacy, as well as to analyze food and beverage sources that currently contribute to the dietary intake of carbohydrates, lipids and proteins according to sex and age.

Materials and Methods used

The design, protocol and methodology of the ANIBES study have been previously described in detail in Ruiz E. et al, 2015 and Varela-Moreiras G. et al, 2015.

The final sample comprised 2,009 individuals, of which 1,013 were men (50.4 %) and 996 were women (49.6 %). In addition, for the youngest age groups (9-12 and 13-17 years-old), a boost sample was included to have participants from all age groups (error ± 6.9 %). Therefore, the random sample plus booster comprised 2,285 participants and was classified according to the following variables:

- **Age groups:** 9-12 (children), 13-17 (adolescents), 18-64 (adults) and 65-75 (seniors)
- **Sex:** men and women
- **Geographical distribution:** Northeast, Levant, South, Central, Northwest, Balearic and Canary Islands, and Madrid metropolitan area and Barcelona metropolitan area.
- **Locality size:**
    - 2,000 to 30,000 inhabitants ("rural" population)
    - 30,000 to 200,000 inhabitants ("semi-urban" population)
    - over 200,000 inhabitants ("urban" population)

The fieldwork of the ANIBES study was carried out within three months, between September and November 2013, having previously developed two pilot studies (June-September 2013), validating the methodology to be used.

Macronutrient Daily Intake and Dietary Sources

Proteins

The mean daily protein intake in the ANIBES study population was 74.5 ± 22.4 g/day, with significant differences between sexes, as it was higher in men than in women. According to the age group, the oldest showed the lowest intake.

In the ANIBES study, overall protein intake was well above the upper recommended limit (set at 15 % of total energy), regardless of sex or age group. The dietary reference intake for total protein suggests it should be about 0.8 g/kg body weight for adults, representing 12 % of total energy intake.

In fact, only 10 % of the ANIBES population (P10) would be within the recommended range for dietary protein intake. However, if we refer to the acceptable range proposed by the IoM (Institute of Medicine from the USA) in 2012 for protein intake (10 % - 35 % of total energy), the results from the ANIBES study would be within the limits.

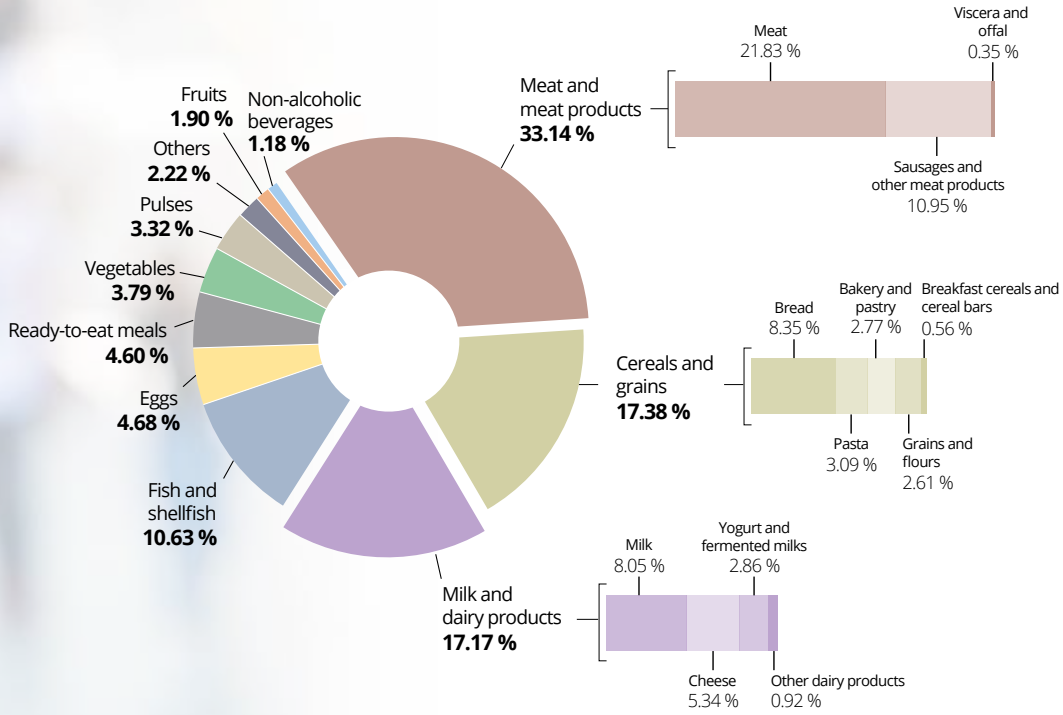
As collected by EFSA (European Food Safety Authority) in 2012, in most European countries, the main contributor to the dietary protein intake is meat and meat products, followed by cereals and grains and milk and dairy products. All together they contribute to about 75 % of the protein intake.

Meat and meat products group was the main source of protein for the whole ANIBES study population (33.14 %), although this contributed much more among younger groups and less so among older adults.

Cereals and grains group and milk and dairy products group ranked second and third, respectively, as protein sources. These three food and beverage groups (meat and meat products, cereals and grains and milk and dairy products) contributed over 68 % of the total protein intake.

Other protein-rich foods were fish and shellfish group, much higher in older adults. Vegetables and pulses contributed only 7 % to total daily protein intake and were especially low in the youngest age groups.

Protein intake (by food and beverage groups)



Carbohydrates

The WHO (World Health Organization) and FAO (Food Agriculture Organization) recommended in 1988 that total carbohydrate in the diet should provide 55 %-75 % of total energy, even though later, the same institutions suggested a new lower limit, 50 % of total energy intake. For its part, EFSA proposed in 2010 a range between 45 % and 60 % of total energy for carbohydrate intake.

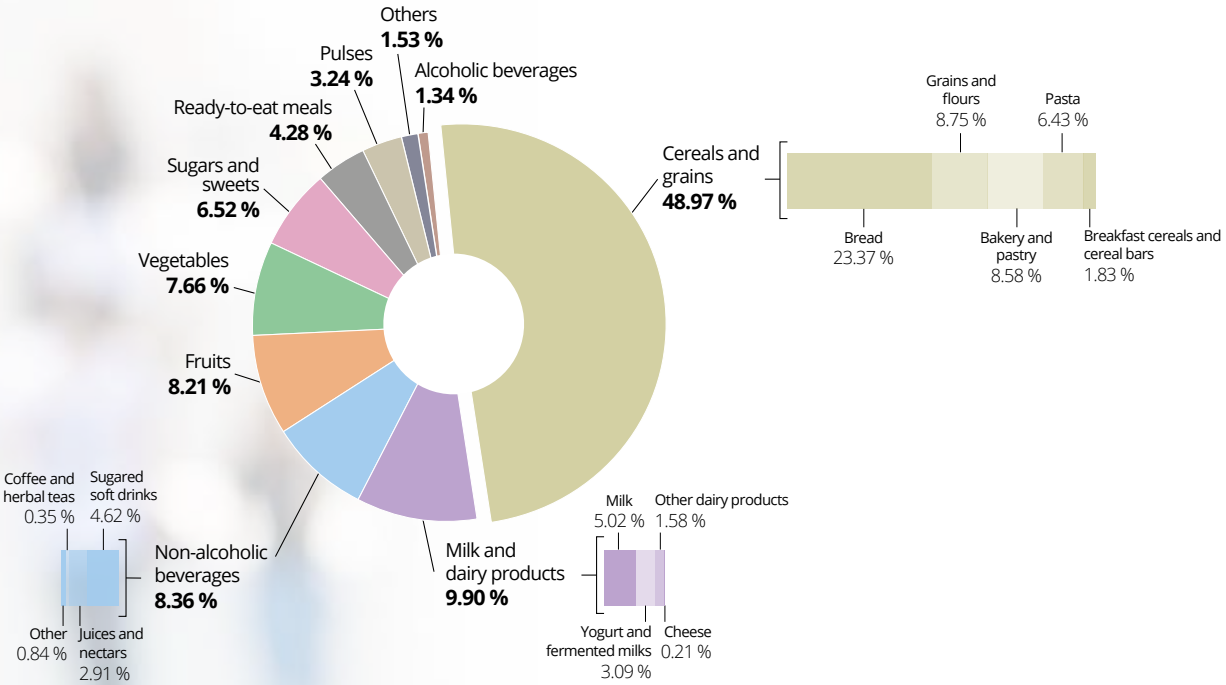
In Spain, the SENC (Spanish Society of Community Nutrition) recommends that carbohydrates should provide 50 %-60 % of total energy.

Mean carbohydrate intake in the ANIBES population was 185.4 ± 60.9 g/day (37.8 g/day min; 450.3 g/day max). Higher total carbohydrate consumption was observed in younger age groups as compared to adults and older adults and in men than in women. Regarding sugar intake, this was higher in children and adolescents and markedly lower in adults and older adults, unlike with fiber intake, where it was much higher in older adults than in the youngest populations.

In the ANIBES study, cereals and grains group represents the highest contribution to total carbohydrates in the diet (48.97 %), with bread as the main contributor. Within this group, bakery and pastry ranked next, and this category was higher for children than for adults and older adults. Cereals and grains were followed to a much lesser extent by the groups of milk and dairy products (9.90 %), non-alcoholic beverages, fruits, vegetables, sugars and sweets and with much lower contributions from the groups of ready-to-eat meals, pulses, alcoholic beverages and appetizers (together accounting for 10 % of the total).

Due to their additional high content in fiber and low energy content, whole-grain cereals, vegetables, pulses and fruits are the most recognized sources for dietary carbohydrates. As derived from the ANIBES study data, fiber is found mainly in vegetables, bread, fruits and pulses food groups and subgroups, even though total amount of fiber is lower than recommended.

Carbohydrate intake (by food and beverage groups)



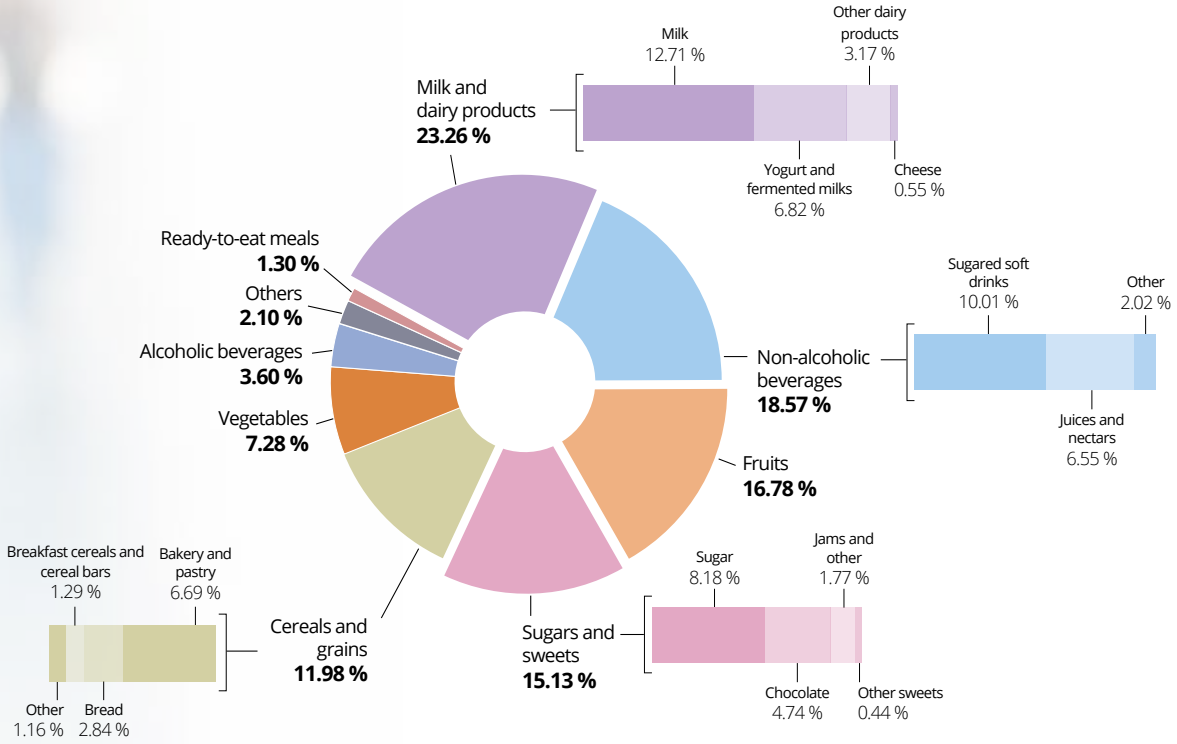
Sugars

As for sugar intake, it was 76.3 ± 33.9 g/day (79.5 ± 36.6 g/day in men, 73.0 ± 30.6 g/day in women). Differences were seen according to age group with significantly higher intakes in children and adolescents compared to those observed in adults and older adults.

Considering sugar intake by food and beverage group, milk and dairy products were the main contributors, followed by non-alcoholic beverages, fruits, sugars and sweets and cereals and grains. It is important that each group is analyzed separately by subgroup due to the different type of sugars they contribute. Groups with much lower sugar contribution were ready-to-eat meals, sauces and condiments, meat and meat products and pulses (with roughly 1 % each).

Regarding daily maximum sugar intake recommendations, EFSA does not set an upper limit, even though there is some evidence that high sugar intake of 20 % of energy in the diet may increase serum triglyceride and cholesterol concentrations and might adversely affect serum glucose and insulin levels. Furthermore, in a recent publication, the WHO recommends that adults and children should reduce their daily intake of free sugars to less than 10 % of their total energy intake according to their energy reference intakes in each case. Later, a further reduction to below 5 % has been proposed to potentially provide additional health benefits. In this sense, the ANIBES study suggests that energy from sugars was 17.0 % of total energy intake, a figure significantly higher in females compared to males.

Sugar intake (by food and beverage groups)

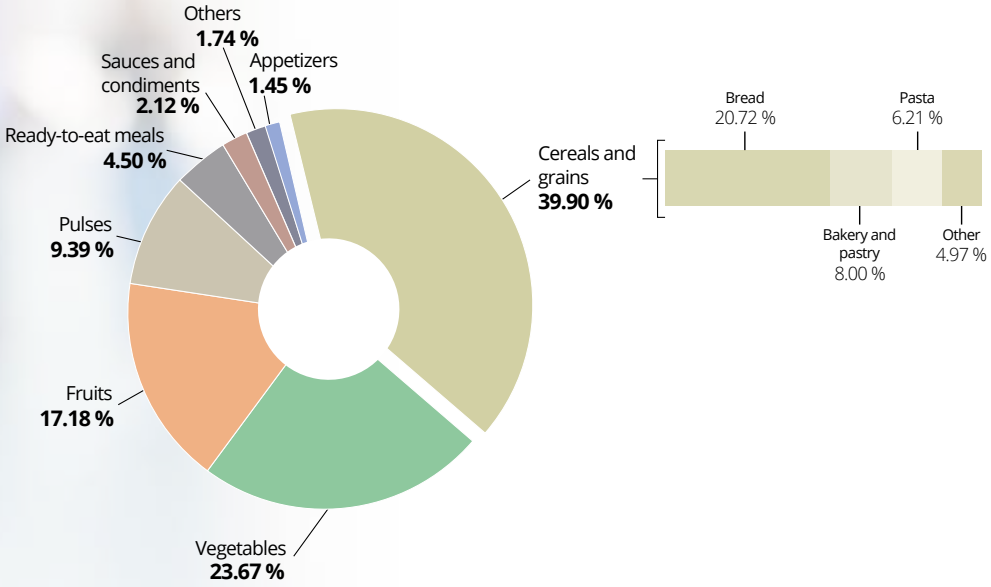


Fiber

The mean daily fiber intake was 12.7 ± 5.6 g/day (2.2 g/day min; 45.1 g/day max) with differences between men and women. Moreover, values were much higher in older adults than in the youngest populations. In any case, the recommendations and nutritional goals set for the Spanish population are not reached.

Dietary fiber in the ANIBES population was found in descending order to be mainly from cereals and grains group (39.90 %), vegetables group (23.67 %), fruits group (17.18 %) and pulses group (9.39 %).

Fiber intake (by food and beverage groups)



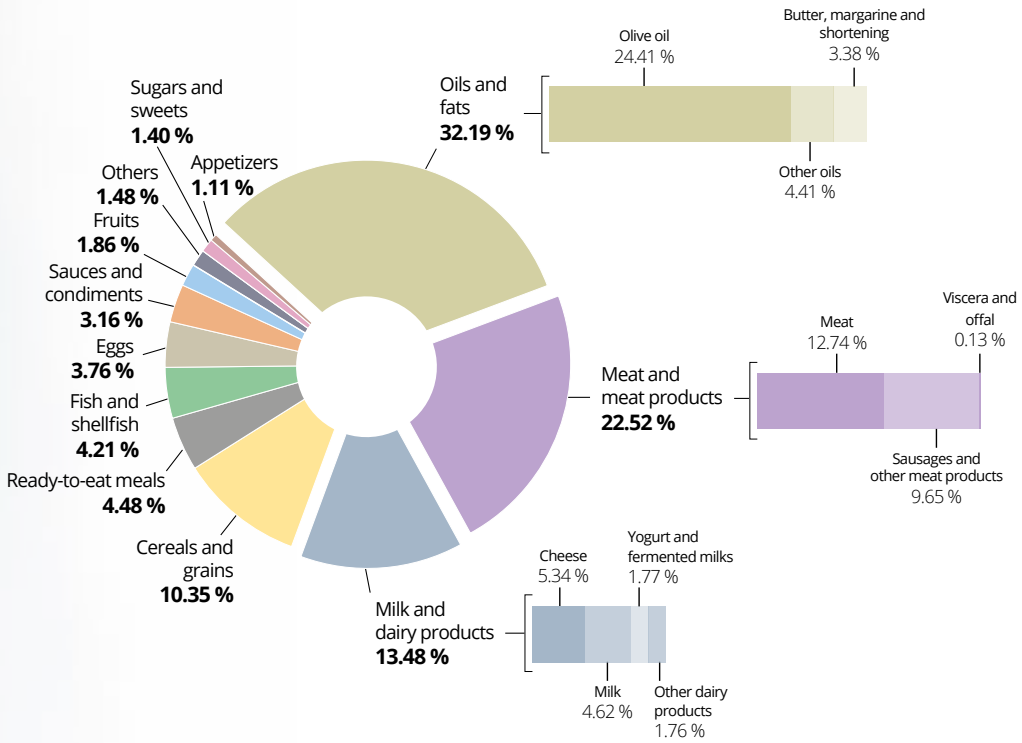
Lipids

Both from the WHO and FAO (2010) at a global level, and the EFSA at a European level, a lower boundary for the reference lipid intake range of 20 % of energy and an upper boundary of 35 % of energy have been proposed.

Mean lipid intake in the ANIBES study was 78.1 ± 26.1 g/day. Values were much higher among younger age groups than older adults. Sex differences were also observed, being higher in men in all age groups. Furthermore, a decreasing trend in lipid intake with advancing age is observed.

Oils and fats group represented the main source of lipids (32.19 %), of which olive oil subgroup accounted for 24.41 %, as well as meat and meat products group (22.52 %), followed by milk and dairy products group, with cheese as the main subgroup with a higher contribution. Cereals and grains group, and mainly bakery and pastry subgroup, were the fourth contributor to lipid intake. The remaining groups only contributed from 1 % to 5 %.

Lipid intake (by food and beverage groups)

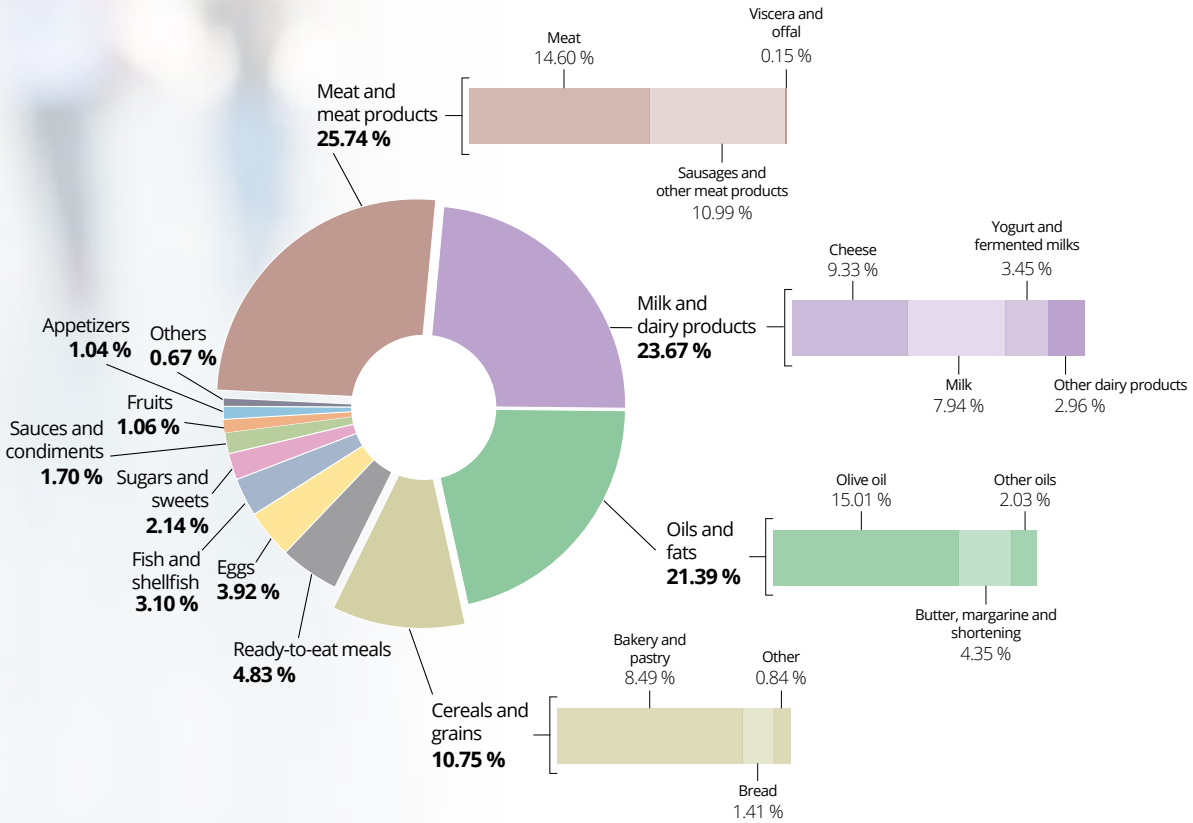


Saturated Fatty Acids (SFA)

Saturated Fatty Acids (SFA) were obtained primarily and almost equally from the groups of meat and meat products, milk and dairy products and oils and fats. In younger age groups, the greatest contribution came from the sausages and other meat products subgroup, followed by bakery and pastry subgroup. In adults and older adults, olive oil subgroup and meat subgroup ranked as the primary contributors of this type of fatty acids.

The WHO and FAO have recommended a maximum intake of 10 % of total daily energy intake for SFA. In this sense, the SFA intake in the ANIBES study was also above the recommendations for all age groups and both sexes.

SFA intake (by food and beverage groups)



Monounsaturated Fatty Acids (MUFA)

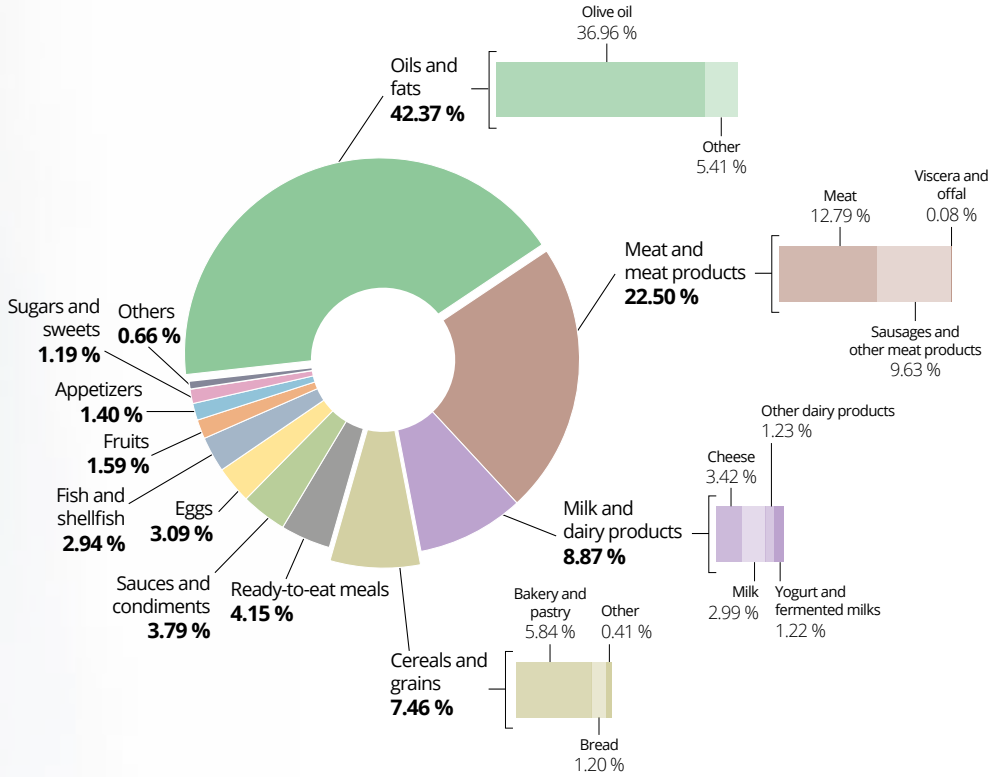
As for **Monounsaturated Fatty Acids (MUFA)** intake, oils and fats group was the greatest contributor, of which olive oil subgroup accounted for 36.9 %. Large differences were observed across the different age groups, with olive oil subgroup as the main contributor (roughly 30 %) among children and adolescents, but nearly 50 % in the older adult population.

MUFA intake was slightly higher in the older adult group and lower among children and adolescents, once again showing a better adherence to the Mediterranean diet in the adult and senior populations.

Meat and meat products group was other major contributor for MUFA intake in children and adolescents (contributing to a much lesser extent in the adult groups).

The FAO and WHO have recommended an intake of this type of fatty acids of about 16 %-19 %. In contrast, EFSA has not set any reference value in this respect.

MUFA intake (by food and beverage groups)



Polyunsaturated Fatty Acids (PUFA)

In the ANIBES study, **Polyunsaturated Fatty Acids (PUFA)** contributed roughly 6.6 % of total energy intake, with no sex or age differences, whereas *n*-3 PUFA intake was 0.63 % of total energy for the ANIBES study population and increased with age.

Oils and fats group was the main contributor (33.02 %), followed by meat and meat products (20.33 %) and cereals and grains (14.68 %), whereas fish and shellfish group accounted for 8.53 %. Olive oil subgroup was the highest individual contributor, with 25.9 % for older adults, percentage that drops to less than 15 % for children and adolescents.

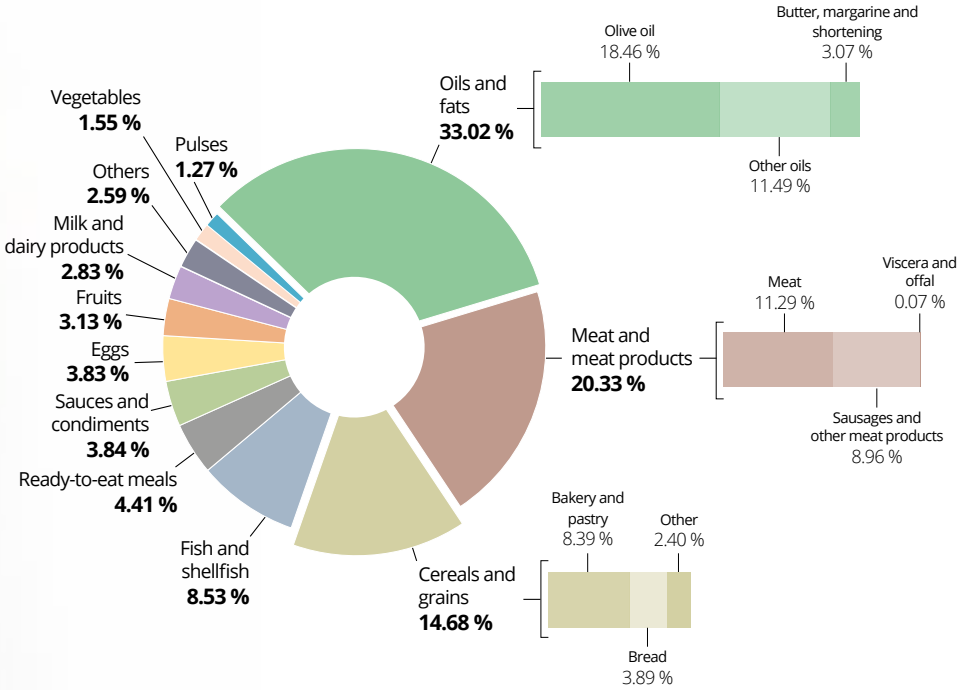
Differences were also seen according to age for meat and meat products group (after meat subgroup, sausages and other meat products subgroup had a higher contribution in the youngest groups) and for fish and shellfish group (10.2 % in older adults vs. 4.7 % in children).

Interestingly, meat subgroup ranked first in the older groups for ***n*-6 fatty** acid intake, whereas in the youngest groups, sausages and other meat products subgroup ranked first.

On the other hand, fish and shellfish group was the main contributor to ***n*-3 fatty acid** intake in older adults and adults and ranked second to meat subgroup among both children and adolescents.

As in the case of monounsaturated fatty acids, EFSA has proposed not to formulate a dietary reference value for this fatty acid family. The FAO and WHO have suggested that polyunsaturated fatty acids should contribute 6 %-10 % of total energy.

PUFA intake (by food and beverage groups)



Daily nutrient intake and distribution in the Spanish ANIBES study population (9-75 years old)

Nutrients	Mean	SD	SEM	P5	P10	P25	P50	P75	P90	P95	Min	Max
Proteins (g)	**74.5**	**22.4**	**0.5**	**43.9**	**48.2**	**59.2**	**71.8**	**87.0**	**103.9**	**112.3**	**28.2**	**352.5**
Carbohydrates (g)	**185.4**	**60.9**	**1.4**	**99.4**	**114.2**	**143.2**	**177.4**	**222.1**	**267.3**	**294.9**	**37.8**	**450.3**
Sugar (g)	76.3	33.9	0.8	30.0	37.3	52.5	71.5	96.2	122.9	136.7	6.7	263.6
Lipids (g)	**78.1**	**26.1**	**0.6**	**41.4**	**47.3**	**59.5**	**75.0**	**93.0**	**113.4**	**126.5**	**21.0**	**201.5**
SFA (g)	24.0	9.5	0.2	11.0	12.9	17.3	22.6	29.4	36.2	40.9	5.1	86.6
MUFA (g)	33.7	11.3	0.3	18.2	20.4	25.3	32.7	40.1	48.5	53.6	8.8	96.7
PUFA (g)	13.4	6.1	0.1	5.7	6.7	9.0	12.3	16.6	21.2	24.5	2.6	50.6
n-6 (g)	11.1	5.5	0.1	4.1	5.1	7.0	10.1	14.0	18.4	21.1	1.4	45.1
n-3 (g)	1.3	11.6	0.3	0.4	0.5	0.6	0.9	1.3	1.9	2.4	0.2	520.7
Cholesterol (mg)	315.0	137.0	3.0	136.0	162.0	215.0	298.0	389.0	492.0	557.0	11.0	1,584.0
Fiber (g)	**12.7**	**5.6**	**0.1**	**5.4**	**6.5**	**8.7**	**11.8**	**15.6**	**19.7**	**22.9**	**2.2**	**45.1**
Alcohol (g)	**5.4**	**10.6**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**6.8**	**17.3**	**26.2**	**0.0**	**110.8**
Water (mL)	**1,626.0**	**641.0**	**14.0**	**819.0**	**944.0**	**1,173.0**	**1,489.0**	**1,960.0**	**2,533.0**	**2,842.0**	**368.0**	**5,683.0**

SD: standard deviation; SEM: standard error; P: Percentile

ANIBES

Total daily nutrient intake by sex and age group in the Spanish ANIBES study population

GENERAL 9-75 YEARS*

	Total	Men	Women
sample (*n*)	2,009	1,013	996
Energy (kcal)	**1,810.0 ± 504.0**	**1,957.0 ± 531.0**	**1,660.0 ± 427.0 ** **
Proteins (g)	**74.5 ± 22.4**	**80.3 ± 24.9**	**68.5 ± 17.7** **
Carbohydrates (g)	**185.4 ± 60.9**	**200.0 ± 64.9**	**170.7 ± 52.7** **
Sugar (g)	76.3 ± 33.9	79.5 ± 36.6	73.0 ± 30.6**
Lipids (g)	**78.1 ± 26.1**	**83.7 ± 27.2**	**72.4 ± 23.6** **
SFA (g)	24.0 ± 9.5	25.8 ± 10.0	22.1 ± 8.7**
MUFA (g)	33.7 ± 11.3	36.1 ± 11.9	31.3 ± 10.2**
PUFA (g)	13.4 ± 6.1	14.4 ± 6.5	12.5 ± 5.5**
n-6 (g)	11.1 ± 5.5	11.9 ± 5.8	10.1 ± 5.0**
n-3 (g)	1.3 ± 11.6	1.6 ± 16.3	1.0 ± 0.7
Cholesterol (mg)	315.0 ± 137.0	345.0 ± 146.0	284.0 ± 121.0**
Fiber (g)	**12.7 ± 5.6**	**13.1 ± 6.1**	**12.2 ± 5.2** **
Alcohol (g)	**5.4 ± 10.6**	**7.3 ± 12.8**	**3.5 ± 7.3** **
Water (mL)	**1,626.0 ± 641.0**	**1,666.0 ± 679.0**	**1,585.0 ± 596.0** **

*Mean ± standard deviation
**Statistical difference by sex $p \leq 0.05$

Total daily nutrient intake by sex and age group in the Spanish ANIBES study population

CHILDREN 9-12 YEARS*

	Total	Men	Women
sample (*n*)	213	126	87
Energy (kcal)	**1,960.0 ± 431.0**	**2,006.0 ± 456.0**	**1,893.0 ± 385.0****
Proteins (g)	**77.6 ± 18.9**	**80.6 ± 19.0**	**73.3 ± 18.1****
Carbohydrates (g)	**214.3 ± 57.1**	**218.2 ± 61.1**	**208.7 ± 50.7**
Sugar (g)	91.6 ± 33.3	93.7 ± 35.3	88.4 ± 30.1
Lipids (g)	**85.1 ± 22.1**	**87.3 ± 23.2**	**82.1 ± 20.0**
SFA (g)	28.7 ± 8.7	29.6 ± 9.3	27.5 ± 7.5
MUFA (g)	34.9 ± 9.6	35.8 ± 10.2	33.6 ± 8.6
PUFA (g)	14.1 ± 5.2	14.2 ± 5.1	14.0 ± 5.4
n-6 (g)	12.0 ± 4.8	12.1 ± 4.6	11.9 ± 5.1
n-3 (g)	0.9 ± 0.5	1.0 ± 0.5	0.9 ± 0.5
Cholesterol (mg)	328.0 ± 110.0	347.0 ± 112.0	299.0 ± 102.0**
Fiber (g)	**11.8 ± 4.3**	**11.5 ± 4.0**	**12.2 ± 4.6**
Alcohol (g)	**0.0 ± 0.0**	**0.0 ± 0.0**	**0.0 ± 0.0**
Water (mL)	**1,392.0 ± 484.0**	**1,432.0 ± 514.0**	**1,335.0 ± 434.0**

*Mean ± standard deviation
**Statistical difference by sex $p \leq 0.05$

ANIBES

Total daily nutrient intake by sex and age group in the Spanish ANIBES study population

ADOLESCENTS 13-17 YEARS*

	Total	Men	Women
sample (*n*)	211	137	74
Energy (kcal)	**2,018.0 ± 508.0**	**2,124.0 ± 515.0**	**1,823.0 ± 436.0****
Proteins (g)	**80.0 ± 21.0**	**85.0 ± 21.0**	**70.6 ± 17.7****
Carbohydrates (g)	**224.6 ± 67.5**	**234.5 ± 70.0**	**206.1 ± 58.8****
Sugar (g)	89.3 ± 35.1	90.8 ± 37.2	86.6 ± 31.0
Lipids (g)	**85.9 ± 25.8**	**90.9 ± 25.9**	**76.7 ± 23.1****
SFA (g)	28.3 ± 9.6	30.0 ± 9.6	25.2 ± 9.0**
MUFA (g)	35.1 ± 10.9	37.3 ± 11.3	31.2 ± 8.9**
PUFA (g)	14.7 ± 6.3	15.4 ± 6.3	13.4 ± 6.2**
n-6 (g)	12.6 ± 5.8	13.2 ± 5.8	11.5 ± 5.7**
n-3 (g)	1.0 ± 0.6	1.0 ± 0.6	0.9 ± 0.5
Cholesterol (mg)	342.0 ± 139.0	368.0 ± 139.0	294.0 ± 128.0**
Fiber (g)	**11.8 ± 4.7**	**12.1 ± 4.8**	**11.2 ± 4.6**
Alcohol (g)	**0.1 ± 0.6**	**0.0 ± 0.4**	**0.1 ± 0.8**
Water (mL)	**1,336.0 ± 464.0**	**1,391.0 ± 511.0**	**1,236.0 ± 345.0****

*Mean ± standard deviation
**Statistical difference by sex $p \leq 0.05$

Total daily nutrient intake by sex and age group in the Spanish ANIBES study population

ADULTS 18-64 YEARS*

	Total	Men	Women
sample (*n*)	1,655	798	857
Energy (kcal)	**1,816.0 ± 512.0**	**1,966.0 ± 543.0**	**1,675.0 ± 437.0****
Proteins (g)	**74.8 ± 22.9**	**81.0 ± 26.0**	**69.0 ± 17.8****
Carbohydrates (g)	**184.0 ± 60.4**	**198.7 ± 64.6**	**170.3 ± 52.8****
Sugar (g)	74.9 ± 33.8	78.4 ± 36.7	71.7 ± 30.5**
Lipids (g)	**78.7 ± 26.5**	**84.2 ± 27.8**	**73.6 ± 24.2****
SFA (g)	24.0 ± 9.6	25.7 ± 10.1	22.5 ± 8.8**
MUFA (g)	34.0 ± 11.6	36.4 ± 12.3	31.8 ± 10.5**
PUFA (g)	13.6 ± 6.1	14.6 ± 6.5	12.7 ± 5.6**
n-6 (g)	11.2 ± 5.5	12.1 ± 5.9	10.3 ± 5.0**
n-3 (g)	1.4 ± 12.8	1.8 ± 18.4	1.0 ± 0.7**
Cholesterol (mg)	316.0 ± 137.0	347.0 ± 144.0	287.0 ± 122.0**
Fiber (g)	**12.6 ± 5.7**	**13.1 ± 6.1**	**12.1 ± 5.2****
Alcohol (g)	**6.1 ± 11.1**	**8.3 ± 13.3**	**4.0 ± 8.0****
Water (mL)	**1,663.0 ± 661.0**	**1,722.0 ± 703.0**	**1,608.0 ± 614.0****

*Mean ± standard deviation
**Statistical difference by sex $p \leq 0.05$

ANIBES

Total daily nutrient intake by sex and age group in the Spanish ANIBES study population

ELDERLY 65-75 YEARS*

	Total	Men	Women
sample (*n*)	206	99	107
Energy (kcal)	**1,618.0 ± 448.0**	**1,771.0 ± 485.0**	**1,476.0 ± 360.0****
Proteins (g)	**67.7 ± 21.0**	**73.5 ± 23.9**	**62.4 ± 16.3****
Carbohydrates (g)	**163.7 ± 53.4**	**175.0 ± 59.7**	**153.3 ± 44.7****
Sugar (g)	73.0 ± 34.0	74.2 ± 37.4	71.8 ± 30.6
Lipids (g)	**67.4 ± 22.1**	**73.2 ± 23.0**	**62.0 ± 19.8****
SFA (g)	19.3 ± 7.5	20.8 ± 7.6	17.9 ± 7.1**
MUFA (g)	30.6 ± 9.7	33.1 ± 9.6	28.3 ± 9.2**
PUFA (g)	11.4 ± 6.5	12.6 ± 7.7	10.3 ± 5**
n-6 (g)	9.0 ± 5.3	9.9 ± 6.1	8.3 ± 4.4**
n-3 (g)	1.1 ± 0.9	1.4 ± 1.1	0.9 ± 0.5**
Cholesterol (mg)	296.0 ± 153.0	320.0 ± 174.0	273.0 ± 128.0**
Fiber (g)	**14.6 ± 6.8**	**15.7 ± 7.7**	**13.6 ± 5.6****
Alcohol (g)	**7.0 ± 12.6**	**10.8 ± 14.8**	**3.5 ± 8.7****
Water (mL)	**1,583.0 ± 539.0**	**1,586.0 ± 575.0**	**1,580.0 ± 506.0**

*Mean ± standard deviation
**Statistical difference by sex $p \leq 0.05$

References

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). Scientific Opinion on Dietary Reference Values for carbohydrates and dietary fibre. EFSA Journal, 2010;8(3):1462.

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). Scientific Opinion on Dietary Reference Values for protein. EFSA Journal, 2012;10(2):2557.

Institute of Medicine (IoM). Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids (2002/2005). Available at: http://www.nap.edu/catalog.php?record_id=10490.

Serra-Majem L, Aranceta-Bartrina J. Objetivos nutricionales para la población española. Consenso de la Sociedad Española de Nutrición Comunitaria, 2011. Rev. Esp. Nutr. Comunit., 2011;17(4):178-199.

Moreiras O, Carbajal A, Cabrera L, Cuadrado C. Tablas de Composición de Alimentos/Guía de Prácticas. 16 ed. Madrid: Ediciones Pirámide, 2013.

Ruiz E, Ávila JM, Valero T, del Pozo S, Rodríguez P, Aranceta-Bartrina J, Gil A, González-Gross M, Ortega RM, Serra-Majem Ll, Varela-Moreiras G. Macronutrient Distribution and Dietary Sources in the Spanish Population: Findings from the ANIBES Study. Nutrients, 2016;8(3):177; doi:10.3390/nu8030177.

Ruiz E, Ávila JM, Castillo A, Valero T, del Pozo S, Rodríguez P, Aranceta-Bartrina J, Gil A, González-Gross M, Ortega RM, Serra-Majem Ll, Varela-Moreiras G. The ANIBES Study on Energy Balance in Spain: Design, Protocol and Methodology. Nutrients, 2015;7:970–998.

Varela-Moreiras G, Ávila JM, Ruiz E. Energy Balance, a new paradigm and methodological issues: The ANIBES study in Spain. Nutr. Hosp., 2015;31(3):101–112.

Scientific Committee

- Prof. Javier Aranceta, MD, PhD
  Chairman of the Scientific Committee of the Spanish Society of Community Nutrition (SENC), Clinical Director of the Spanish Foundation for Nutritional Research (FIN) and Associate Professor of Community Nutrition at the University of Navarra

- Prof. Ángel Gil, PhD
  Chairman of the Iberoamerican Nutrition Foundation (FINUT), Director of the BioNit Scientific Group and Professor of Biochemistry and Molecular Biology at the University of Granada

- Prof. Marcela González-Gross, PhD
  Vice President of the Spanish Nutrition Society (SEÑ), Head of the imFine Research Group and Professor of Sports Nutrition and Exercise Physiology at the Technical University of Madrid

- Prof. Rosa Mª Ortega, PhD
  Director of the VALORNUT Research Group and Professor of Nutrition at the Complutense University of Madrid

- Prof. Lluìs Serra-Majem, MD, PhD
  Chairman of the Spanish Foundation for Nutritional Research (FIN), Chairman of the Spanish Nutrition and Food Sciences Academy (AEN), Director of the Biomedical and Health Research Institute and Professor of Preventive Medicine and Public Health at the University of Las Palmas de Gran Canaria

- Prof. Gregorio Varela-Moreiras, PhD
  Chairman of the Spanish Nutrition Foundation (FEN), Director of the Nutrition and Food Sciences Research Group (CEUNUT) and Professor of Nutrition and Bromatology at CEU San Pablo University of Madrid

The final protocol of the ANIBES scientific study was previously approved by the Clinical Research Ethics Committee of the Autonomous Region of Madrid (Spain).


ANIBES