

FOOD DIETS IN EC COUNTRIES

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Food diets in EC countries present bigger similarities nowadays than they used to have in recent years. This trend has been no doubt encouraged by the trade liberalization among Community countries.

The Community average apparent consumption of different products, in calories terms, has had the following evolution between 1976-1978 and 1987-1989 (Table 1): a) a relative increase in vegetable oils, animal fats, vegetables, rice, meat, pulses and nuts; and b) a relative decrease in dairy products, sugar, potato, cereals and eggs.

Biggest increases have occurred on vegetable oils (46%), animal fats (19%) and vegetables (19%) (Table 1). The increase on vegetable oils consumption has occurred in every EC country, except for Spain where it decreased slightly. Consumption increments of vegetables have also occurred in most countries except for Germany, which had the same share, and for Great Britain, where the share increased slightly. However, animal fats consumption evolution has not been so homogenous, although the overall Community average increased, and some countries, such as Denmark, Germany, France and Portugal have had a decline. The other increments have been slight: 14% for rice, 11% for meat and 10% for pulses and nuts. Increases in the two first products have occurred in every country. However, Italy and Holland have had a contrary trend on pulses and nuts.

The proportions of dairy products and sugar have decreased 22% and 19%, respectively. These reductions have occurred in every EC country except for Portugal for dairy products, where the quantity consumed was the lowest in 1976-1978, and Benelux for sugar. The proportion of potato, cereals and eggs, in the average Community diet, have decreased slightly 7%, 6%, and 5%, respectively.

Food diets in different countries have been approaching in between 1976-1978 and 1987-1989, with smaller variation coefficients for all products except for potato, vegetables and animal fats.

In this paper, firstly, the overall animal and vegetable products consumption evolution in Community countries is analyzed between 1961 and 1989. Secondly, factors that have been influencing more strongly food consumption patterns in EC countries have been identified in 1987-1989.

Abstract

Food diets in EC countries present closer similarities nowadays than they used to have in recent years. The most important changes on food consumption during the last decade have been: a) a consumption increase in vegetable oils, animal fats, vegetables, rice, meat, pulses and nuts; and b) a consumption decrease in dairy products, sugar, potatoes, cereals and eggs.

Total food consumption trends, as well as, animal and vegetal products consumption are analyzed using apparent per capita consumption data transformed to calories. Factor analysis is used to select the main factors that have been influencing EC food consumption patterns which also enables to classify countries in several groups.

In spite of that food diets are becoming more similar, EC countries can be divided into Northern countries and Mediterranean countries. The first ones are the main consumers of meat, dairy products, sugar and the second ones of cereals, pulses, nuts, vegetables and vegetable oils.

Résumé

Les diètes alimentaires dans les pays communautaires présentent aujourd'hui plus de similitudes qu'avant. Les changements les plus importants qu'a subis la consommation alimentaire durant la dernière décennie ont été: a) une augmentation de la consommation de huiles végétales, graisses animales, légumes, riz, légumineuses et noix; et b) une diminution de la consommation de produits laitiers, sucre, pomme de terre, céréales et oeufs.

Les tendances de la consommation totale aussi bien que de la consommation de produits d'origine animale face à la consommation de produits végétaux ont été analysées moyennant la consommation apparente par habitant transformée en calories. L'analyse factorielle a été utilisée afin de ressortir les principaux facteurs qui ont pu influencer les habitudes de consommation et elle a permis à la fois de classer les pays sous forme de différents groupes.

Malgré que les diètes alimentaires deviennent de plus en plus similaires, les pays communautaires peuvent être séparés en pays Nordiques et pays Méditerranéens. Le premier groupe est le premier consommateur de viande, produits laitiers et sucre, alors que le second groupe consomme plus de céréales, légumineuses, noix, légumes et huiles végétales.

Food consumption evolution in EC countries

The apparent average food consumption in EC countries, was 3,104 calories per capita and day, in 1961-1963 (Table 2). This con-

sumption has increased at an average rate of 0.5% per year and it reached 3,569 calories in 1987-1989. Consumption in different Community countries has had an upward trend except for Holland, where it has remained constant, and Great Britain, where it has been reduced by 4%.

Table 1 Average calories, standard deviation and variation coefficient of food products consumed in EC countries (%).

	1976-1978			1987-1989			%
	Mean	Std.	V.C.	Mean	Std.	V.C.	
Cereals	26.7	5.2	0.2	25.1	4.6	0.2	-6
Rice	1.5	1.3	0.9	1.7	1.2	0.7	14
Sugar	14.1	3.0	0.2	11.4	1.9	0.2	-19
Potato	5.8	1.5	0.2	5.4	1.7	0.3	-7
Pul., Nuts	1.7	0.9	0.5	1.9	0.9	0.5	10
Vegetables	1.9	0.6	0.3	2.3	0.8	0.3	19
Fruits	3.5	1.2	0.3	3.5	1.1	0.3	-
Meat	19.4	4.6	0.2	21.6	4.2	0.2	11
Dairy	12	3.6	0.3	9.3	1.7	0.2	-22
Eggs	1.7	0.5	0.3	1.6	0.3	0.2	-5
Veg. oils	7.9	4.5	0.6	11.6	4.7	0.4	46
Anim. fats	3.7	2.2	0.6	4.3	3.1	0.7	19

Source: OECD. Food Consumption Statistics and EUROSTAT. Vegetal and Animal Production.

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Table 2 Average apparent food consumption and per capita income in EC countries (daily calories and dollars).

Years	1961-1963		1969-1971		1979-1981		1987-1989	
Countries	Consumption	Income*	Consumption	Income*	Consumption	Income*	Consumption	Income
Benelux	3,271	4,826	3,428	6,357	3,727	8,009	3,947	9,613
Denmarks	3,305	6,274	3,260	8,302	3,490	9,931	3,622	11,698
Germany	3,110	5,548	3,295	7,361	3,601	9,502	3,831	10,897
Greece	2,866	1,303	3,207	2,242	3,545	3,227	3,793	3,495
Spain	2,772	2,131	2,867	3,264	3,325	4,120	3,567	4,881
France	3,299	4,897	3,280	6,929	3,439	8,998	3,449	10,129
Ireland	3,523	2,664	3,654	3,549	3,737	4,878	3,779	5,764
Italy	2,989	3,518	3,389	5,001	3,561	6,897	3,508	8,133
Holland	3,135	4,936	3,024	6,871	3,111	8,431	3,163	9,044
Portugal	2,570	896	2,914	1,469	3,073	2,113	3,414	2,423
G. Britain	3,303	5,103	3,326	6,138	3,172	7,371	3,181	9,015
Average	3,104	3,827	3,240	5,226	3,435	6,680	3,569	7,736

* Per capita Gross National Product in prices and exchange rate in 1985.
Source: FAO. Production Yearbook and OECD. National Account.

Table 3 Calories distribution between vegetal and animal products consumed in EC countries in 1961-1963, 1969-1971, 1979-1981 and 1987-1989 (%).

	Vegetables calories				Animal calories			
	61-63	69-71	79-81	87-89	61-63	69-71	79-81	87-89
Benelux	0.65	0.64	0.63	0.61	0.35	0.36	0.37	0.39
Denmark	0.61	0.6	0.55	0.54	0.39	0.4	0.45	0.46
Germany	0.68	0.66	0.65	0.64	0.32	0.34	0.35	0.36
Greece	0.84	0.8	0.77	0.76	0.16	0.2	0.23	0.24
Spain	0.84	0.78	0.72	0.69	0.16	0.22	0.28	0.31
France	0.68	0.65	0.62	0.6	0.32	0.35	0.38	0.4
Ireland	0.62	0.61	0.61	0.63	0.38	0.39	0.39	0.37
Italy	0.84	0.81	0.77	0.74	0.16	0.19	0.23	0.26
Holland	0.7	0.68	0.65	0.66	0.3	0.32	0.35	0.34
Portugal	0.84	0.83	0.81	0.77	0.16	0.17	0.19	0.23
G. Britain	0.6	0.61	0.63	0.65	0.4	0.39	0.37	0.35
Average	0.72	0.7	0.67	0.66	0.28	0.3	0.33	0.34

Source: FAO. Production Yearbook.

Countries with the least apparent per capita consumption in 1961-1963 (Portugal, Greece and Spain) have had the biggest increase, about 30%, until 1987-1989. Increments of 20% have occurred in Benelux, Germany and Italy and in the rest of the countries it only raised 10%.

Income is the main factor which explains the evolution of food consumption. It should be a positive correlation between income and consumption, so that countries with bigger income levels should get bigger consumption levels.

However, on food consumption has to be kept in mind that a minimal consumption must be attained. Therefore, with low income levels food consumption is relatively high and if income grows food consumption also grows, but in a lower proportion, up to a threshold which is difficult to surpass. Food consumption holds at this maximum level because of physiological limitations though it can be more diversified.

Income has progressively risen in every EC country during the analyzed period but the percentage increment has been diminishing, specially in those countries where income was relatively small where occurred the highest increments.

However, in the last decade, apparent consumed calories in France, Ireland, Holland and Great Britain have remained stable and, in the rest of countries they have increased slightly (**Table 2**). In the eighties, income has increased in every country, though at a smaller rate than previously while apparent consumption has been constant.

It can be said that consumed calories reached a limit but at a different level in each country.

EC countries attained different income levels in 1987-1989 from 2,400 dollars per capita in Portugal to 11,700 dollars per capita in Denmark.

Nevertheless, it does not exist correlation between income and apparent consumption in calories.

Income differences among different countries are big but food consumption varies in between 3,000 and 4,000 calories per day, and there is not relationship between them.

The proportion of consumed vegetable calories are bigger than animal calories out of the total food consumption in each country (**Table 3**). The share has showed significant changes in many countries in recent years.

The calorie share coming from vegetable products is superior to those from animal products out of the total calories of consumed food.

At the beginning of the sixties and specially in Mediterranean countries (Greece, Spain, Italy and Portugal), the differences were more important, and the consumed vegetables and animal calories, respectively, accounted for 84% and 16% of total food calorie intake. In the rest of the EC countries, over 30% of the total consumed calories were from animal products.

Community countries, except Great Britain and Ireland, have had an upward trend for the share of animal calories consumed. Despite this trend still Mediterranean countries remained with the highest share of vegetables out of the total consumed calories, which at least accounted for 70%.

In 1987-1989, on the average, the EC consumer got 66% and 34% of their total consumed calories from vegetable and animal products, respectively.

Income seems to be a differential factor to explain calorie consumption coming from vegetable and animal products. Thus, countries with income superior to 9,500 dollars

Table 4 Average calories consumed from different food products in EC countries in 1976-1979 (%).

	1	2	3	4	5	6	7	8	9	10	11	12
Benelux	25	1.1	13.5	7.1	1.4	1.6	3.4	24.5	11.6	1.9	3.2	5.7
Denmark	22.5	0.7	17.2	4.6	0.4	1.2	2.5	22.3	16.2	1.7	5.9	4.8
Germany	22	0.6	14.2	5.7	1	1.6	4.7	26.5	12	2.3	4.4	5
Spain	25.3	2	11.1	7.4	2.7	2.7	5.1	14.6	8.6	2.2	17.3	1
France	24.4	1.1	12.7	5.6	1.1	2.2	3	23.5	11.9	1.8	8.5	4.2
Ireland	26	0.6	17.6	7.7	1	1.5	2	19.1	16.6	1.4	5.9	0.6
Italy	38.2	1.5	9.7	2.3	2.3	2.9	3.9	14.4	8.8	1.4	13.3	1.3
Holland	20.6	1.2	14.7	5.4	2.9	1.3	5.9	19.9	16.1	1.5	3.5	7
Portugal	33.5	5.3	11	6.3	3.2	2.6	2.9	11.5	4.9	0.6	12.2	6
G. Britain	25.3	0.8	19.4	5.9	1.3	1.7	2.3	17.6	13.1	2	5	1.4
Average	26.7	1.5	14.1	5.8	1.7	1.9	3.5	19.4	12	1.7	7.9	3.7

Note: In Greece data is not available.

1. Cereals - 2. Rice - 3. Sugar - 4. Potato - 5. Pulses and nuts - 6. Vegetables - 7. Fruits - 8. Meat - 9. Dairy products - 10. Eggs - 11. Vegetables oils - 12. Animal fats.

Source: OECD. Food Consumption Statistics.

Table 5 Average calories consumed from different food products in EC countries in 1987-1989 (%).

	1	2	3	4	5	6	7	8	9	10	11	12
Benelux	23.2	1.6	14.2	6	1.6	1.8	3.8	25.1	8.5	1.8	4.8	7.6
Denmark	19.2	0.7	11.9	3.7	0.8	1.5	2.7	27.1	11	1.8	16.8	2.8
Germany	23.6	0.9	12.4	4.5	1.1	1.6	5.1	28.7	9.9	2.1	5.8	4.4
Greece	28.6	1.5	9.4	4.5	3.2	3	3.7	15.8	8.4	1.4	17.4	2.5
Spain	22.4	2	8.6	6.4	3.7	3.4	3.2	22.1	7	2	16.8	2.4
France	24.2	1.3	11.8	4.5	1	2.4	2.9	24.1	12	2	10.4	3.5
Ireland	30.2	0.7	11.5	8.5	1.4	1.8	2.2	20	10.8	1.3	11	0.8
Italy	32	1.6	8.5	2.2	1.9	3.6	4.1	17.5	7.8	1.3	17.2	3.1
Holland	16.8	1.7	13	5.5	2.4	1.9	5.7	22.8	11.4	1.3	5.7	11.7
Portugal	29.9	5.4	10.3	7	2.9	2.7	2.3	16.8	6.7	1	13.4	1.6
G. Britain	26.4	1.3	14.2	6.8	1.6	1.4	2.8	17.8	9.4	1.7	8.8	7.6
Average	25.1	1.7	11.4	5.4	1.9	2.3	3.5	21.6	9.3	1.6	11.6	4.3

Source: EUROSTAT. Vegetal and Animal Production.

per capita (Benelux, Denmark, Germany and France) had the biggest intake of animal calories and countries with lesser income (except Ireland) had the highest intake of vegetal calories.

Differences among food diets in EC countries

Differences in EC food diets can be better analyzed when different food products are considered. The share of average calorie intake for each product will be useful to study preferences for every country and to analyze differences in food patterns. The analyzed products have been: cereals (1), rice (2), sugar (3), potato (4), pulses and nuts (5), vegetables (6), fruits (7), meat (8), dairy products (9), eggs (10), vegetable oils (11) and animal fats (12).

Each EC country has different food diets and they have not changed much in the last decade (Tables 4 and 5).

The share of calories coming from cereals, sugar, potato and dairy products have generally decreased except for: Germany, Great Britain and Ireland for cereals, Benelux for sugar, Ireland, Great Britain and Portugal for potato, and France and Portugal for dairy products. But, the share of vegetable and meat calories has increased in each country with a remarkably 50% increment

in the Spanish share of meat. The share of vegetable oils has increased almost in each country, with a high increase in Denmark and a slight decrease in Spain. The share of rice, eggs and fruits altogether have been stable, although Spain had a 37% decline for fruits.

Countries with the highest income levels (Denmark, Germany, France, Benelux) were the main meat consumers and countries with the lowest income levels (Portugal, Greece, Ireland and Italy) consumed the highest quantity of cereals and vegetable oils

but the lowest of sugar and meat. Share for other food products does not have a clear relationship with income, therefore individual preferences and habits in every country must be the factors which determine the consumed quantity.

The average Community diet is characterised with a high share of cereals and meats intake calories, which account for 50% of total calories (Figure 1).

However, the food consumption structure is different for each country. It could be interesting to analyze which factors influence

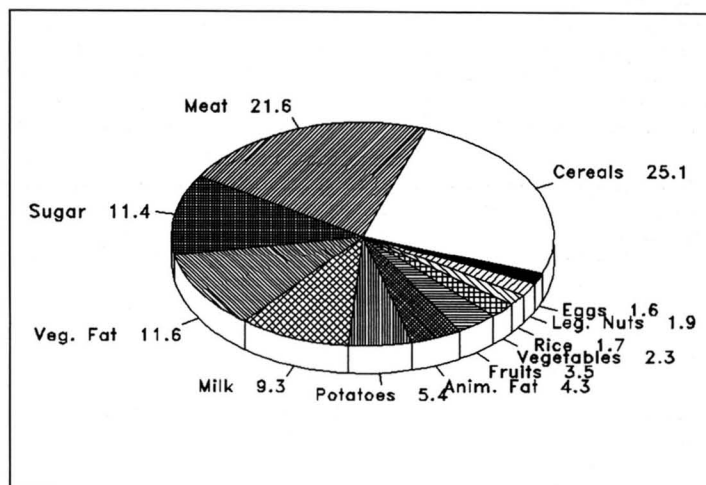


Figure 1 - Consumed calories from different food products in EC countries, in 1987-1989 (%). Source: EUROSTAT. Animal and Vegetal Production.

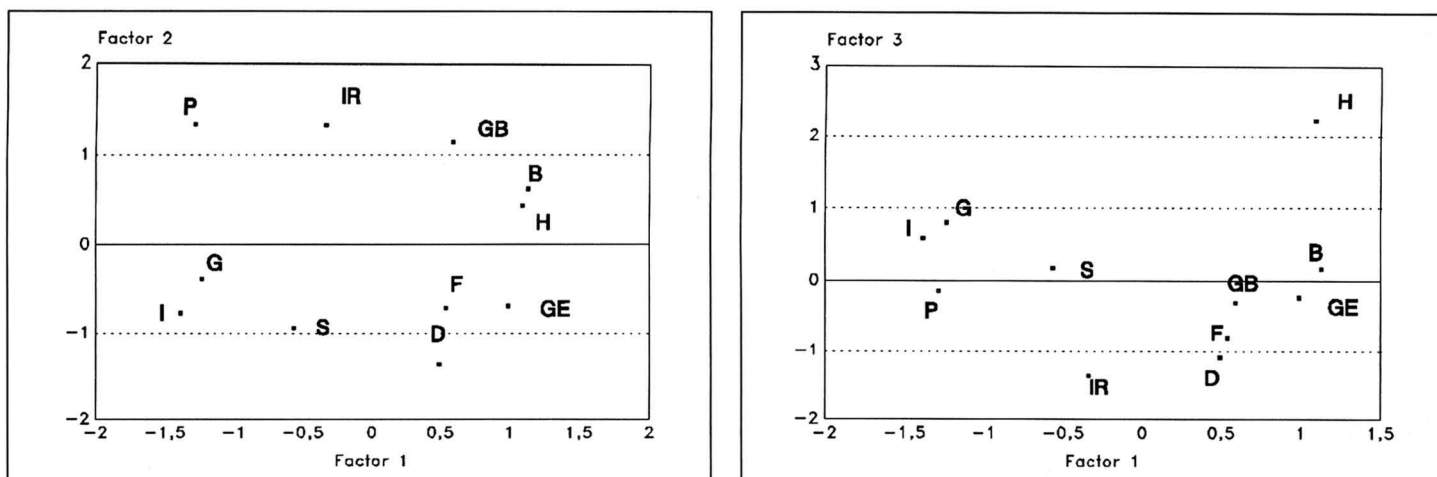


Figure 2 - EC countries in the main factor axes in 1987-1989.

more the EC food diets and to separate and classify countries according to those factors. Factor analysis allows to reduce the number of variables into a small number, the so called factors, that explain about the same variance as the original variables. These factors are a linear combination of the original variables, which have a different weight depending on the strong or weak association that they have with the factor.

Using 1987-1989 data, the first three factors explain a 83.4% of the variance. The first factor explains a 45.1% and is positively correlated with the consumption share of sugar (0.86), meat and dairy products (0.82) and animal fats (0.68) and negatively correlated with cereals and rice (-0.79) and vegetable oils (-0.8) (Table 6). This factor groups together countries with high consumption of caloric products but low of vegetable products with high calorie values (cereals, rice and vegetable oils).

The factor 2 explains 20.8% of the variance and it shows a positive correlation with potatoes (0.77). The factor 3 explains a 17.5% of the variance and it is highly and positively correlated (0.85) with the consumption share of vegetables and fruits.

The representation of the different countries in the factors axes shows that Benelux, Holland, Germany, France, Denmark and Great Britain are countries with a high consumption of animal fats and sugar, and low of cereals, rice and vegetable oils. Mediterranean countries and Ireland are characterised by the opposite (Figure 2).

Then, factor 2 divides the first group mentioned for factor 1 in two groups; the first one has Great Britain, Benelux and Holland with a high consumption of potato and the second one has France, Germany and Denmark, with an opposite behaviour. Mediterranean countries and Ireland are divided into Italy, Greece and Spain with low potato consumption, and Portugal and Ireland with a high consumption.

The factor 3 divides the first group of factor 1 between countries with a significant consumption (Benelux and Holland) and low consumption (Great Britain, Germany, France and Denmark) of vegetables. This factor allocates Mediterranean countries in the positive axe except Portugal that has a slight negative value and they are far from Ireland. This factor shows that although Ireland approaches Mediterranean food consumption patterns, it is the consumption of fruits and vegetables that establishes the main difference.

Conclusions

Food consumption in EC countries has gone through important changes in the last decade, because of an increase in consumption of vegetables oils and animal fats, vegetables, rice, meat, pulses and nuts, and a decrease in dairy products, sugar, potato, cereals and eggs.

Total actual calory consumption in each

Community country is more similar than it used to be at the beginning of the sixties. The proportion of calories coming from animal and vegetal products shows that diets in EC countries are approaching because of the increase, in the majority of them, of the proportion of animal calories and with higher rates in those countries where those proportions were lower.

Differences on food consumption are reducing as a result of decreasing the cereals share on those countries where they were high, though in the rest of them limited changes have occurred. The share of sugar consumption has decreased on every country but in higher quantity in those ones where it was higher. The share of meat products and animal fats has raised in those countries where they were low and it decreased in those ones where they were high. Also the British and Irish food diets are becoming more similar to those on the Mediterranean countries.

In the analyzed period 1987-1989 there was a distinction between Northern Community and Mediterranean countries. The former has a factor which is defined by a high consumption of meat, dairy products and sugar, and low of cereals, rice, vegetables, fruits and vegetable oils. Northern countries are important consumers of meat, dairy products and sugar but their consumption of vegetables products is low; just the opposite from Mediterranean countries.

The other two factors classify the Northern countries between Holland and Benelux, apart from France, Germany and Denmark (Great Britain depends on the factor considered) and the second group of countries into Ireland and Portugal, and Greece, Italy and Spain.

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Table 6 Correlation matrix between original variables and factors in 1987-1989.

Products	Factor 1	Factor 2	Factor 3
Cereals and Rice	-0.79	0.39	-0.2
Sugar	0.86	0.41	-0.08
Potato	0.06	0.77	-0.23
Vegetables and Fruits	-0.32	-0.18	0.85
Meat and Dairy Products	0.82	-0.38	-0.23
Eggs	0.57	-0.56	-0.3
Vegetables oils	-0.8	-0.44	-0.1
Animal fats	0.68	0.2	0.64
Explained variance (%)	45.1	20.8	17.5