

**Consumption of vegetable, fruit and other plant foods
in the EPIC cohorts from 10 European countries**

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Abstract

Objective: To describe and compare the consumption of the main groups and sub-groups of vegetables and fruits (V&F) in men and women from the centres participating in the EPIC study.

Design: Cross-sectional analysis. Dietary intake was assessed by means of a 24-hour dietary recall using computerized interview software and standardized procedures. Crude and adjusted means were computed for the main groups and sub-groups of V&F by centre, separately for men and women. Adjusted means by season, day of the week and age were estimated using weights and covariance analysis.

Setting: 27 centres in 10 European countries participating in the EPIC project.

Subjects: 35,955 subjects (13,031 men and 22,924 women), aged 35–74 years randomly selected from each EPIC cohort.

Results: The centres from southern countries had the highest consumption of V&F, while the lowest intake was seen in the Netherlands and Scandinavia for both genders. These differences were more evident for fruits, particularly citrus. However, slightly different patterns arose for some sub-groups of vegetables, such as root vegetables and cabbage. Adjustment for BMI, physical activity, smoking habits and education did not substantially modify the mean intakes of vegetables and fruits.

Conclusions: Total vegetable and fruit intake follows a south-north gradient in both genders, whereas for several sub-groups of vegetables a different geographic distribution exists. Differences in mean intake of V&F by centre were not explained by lifestyle factors associated with V&F intake.

Introduction

Vegetables and fruits (V&F) are foods relatively rich in vitamins, minerals, and other bioactive compounds, and low in energy. Historically, consumption of V&F has been thought to prevent a wide range of conditions, more based on beliefs than on scientific evidence. However, during recent decades many studies have assessed the association between V&F and health¹. Epidemiological data strongly support a protective effect of increased V&F consumption against epithelial cancers, mainly of the respiratory and digestive tract^{2,3}. Current scientific evidence also suggests a protective role against cardiovascular disease^{4,5}, and evidence is accumulating for a protective effect against stroke⁶. This scientific evidence has led to the fact that most dietary recommendations promote the daily consumption of at least five portions (400 g) of V&F^{2,7,8}.

There seems to be a trend towards lifestyle and dietary uniformity in Europe, with changes towards healthier diets in northern countries, while Mediterranean countries have moved towards more northern dietary patterns⁹. The differences in V&F consumption patterns between regions as well as within populations need to be considered to improve knowledge about nutrition and the health effects of dietary factors. There are several problems in the assessment of V&F consumption in epidemiological studies and comparison across countries. Many studies are carried out in small groups with relatively homogeneous diets, and attenuation of differences because of measurement error cannot be discounted. A major issue when comparing results across populations is the validity and standardization of the instrument used to assess dietary intake. Research on V&F should pay attention not only to the overall intake, but also to consumption of individual foods and sub-groups. Inconsistencies in grouping and classifying V&F, and in expressing these foods as raw weights or weights as consumed must be considered when comparing and/or

pooling results from different studies. The classification of V&F is particularly important, bearing in mind that specific components and mechanisms responsible for health effects are not yet well understood.

The present study assesses V&F consumption in adult populations from cohorts participating in the EPIC project. They belong to ten European countries with wide differences in dietary patterns and other lifestyle factors. A sample of subjects from these cohorts was interviewed in a standardized way to obtain dietary intake information. The specific aims are to describe the dietary intake of V&F overall and for different sub-groups, as well as to compare V&F consumption across countries and regions.

Methods

The results presented arise from the analysis of data from the calibration study carried out within the EPIC project. Details on the design and rationale of both the main study and the calibration study are given elsewhere^{10,11}. Briefly, the EPIC project is a large prospective study involving 519,978 men and women in 23 centres in 10 European countries. Baseline information on usual diet and lifestyle was collected from all subjects, together with anthropometric measurements and a blood sample stored in a centralized biological bank. Dietary information was collected from each study subject by means of country-specific questionnaires. In addition, a single 24-hour dietary recall (24-HDR) was collected from a sample in each centre, as the calibration reference.

Subjects

The calibration population was an age- and sex-stratified random sample from each cohort, with weights according to the number and age–sex distribution of expected cancer cases in

most centres. The sampling procedure was defined to control for seasonal and weekday variations. Participation rates, which ranged from 54% to 92%, were about 75% and above in seven out of ten countries. The initial dataset included 36,900 subjects interviewed; after some exclusions because of incomplete information or technical problems and age restriction to 35–74 years, 35,955 individuals (13,031 men and 22,924 women) were included in the present analysis. In Greece, data collection was coordinated in Athens, but subjects were recruited from all regions of the country. The centre Bilthoven in fact covers several towns from which the subjects were recruited (Amsterdam, Doetinchem, Maastricht). In the UK, subjects recruited from the general population in Oxford and Cambridge were grouped together; another group consisted of the so-called health conscious subjects, which included vegetarians, vegans and fish eaters. Finally, in France and Norway the centres were redefined according to geographical criteria; however, the term “centre” will be used for simplicity for both centres and geographical areas in the rest of the paper. The final analysis involved 27 redefined centres for women and 19 for men; only women were recruited in France, Norway, Utrecht (The Netherlands), and Naples (Italy).

Dietary assessment

Information on dietary intake was gathered by means of a computerized 24-hour dietary recall interview; the structure and details of the software (EPIC-SOFT) have been given elsewhere¹². The information on all foods and beverages consumed during the recalled day was collected, entered, and coded. During the dietary interview each reported food was searched for, described, quantified and checked according to common rules. Methods of quantification included pictures, household measures and standard units. For each food described, the final amount consumed was calculated taking into account the cooking

method used and the edible part consumed in order to express the food as finally consumed by the subject.

Classification of V&F

The present analysis concentrates on two major groups, vegetables and fruits. Each main group was in turn classified into sub-groups. The classification is unique to the EPIC study; it groups foods which could be described and quantified according to common rules across countries. A detailed description of the classification used in this paper, including the main foods belonging to each group or sub-group, is given in Table 1.

For vegetables, the following sub-groups were used: “leafy vegetables”, “fruiting vegetables”, “root vegetables”, “cabbages”, “mushrooms”, “grain and pod vegetables”, “onion and garlic”, “stalk vegetables and sprouts”, “mixed salads and mixed vegetables”, “unclassified”. The sub-group “unclassified” contained, in most cases, food items not fully described during the interview. In this paper, the results for “leafy”, “fruiting”, “root”, “cabbages” and “onion/garlic” are presented separately; the remaining sub-groups accounted for a relatively small proportion of total vegetable intake and were put under the general heading “other”. Results on vegetables are also presented according to the way they are consumed, in two broad categories: raw or cooked.

There were five sub-groups of fruits: “fruits” (main sub-group), “nuts and seeds”, “olives”, “mixed fruits”, and “unclassified”. The main sub-group “fruits” was mainly formed by fresh fruits but it included dried and canned fruits as well. This sub-group accounted for about 90% of total consumption of fruits, so results for the remaining sub-groups were not presented. On the other hand, citrus fruits were considered as a specific sub-group. Thus, results in the present paper are presented for two sub-groups: “citrus fruits” and “non-citrus fruits”, the latter including mainly fresh fruits other than citrus.

Legumes and potatoes and other tubers were considered as independent groups in our classification system. Although they are foods of plant origin and are sometimes included under the broad category of vegetables, most often they are considered separately². They are different from vegetables regarding energy and carbohydrate contents and they are frequently used as a substitute for cereals rather than vegetables. On the other hand, juices and sauces were considered as specific groups in EPIC-SOFT, and two sub-groups, “fruit and vegetable juices” and “tomato sauces”, are actually components of vegetables and fruits. We handled them separately since they are not the same nutritionally. Furthermore, since they were quantified in liquid form, the amount of such food items consumed was difficult to pool together with V&F consumption, which was mainly expressed as solid foods. In order to obtain a complete picture of V&F consumption, data on legumes, potatoes and tubers, fruit and vegetable juices, and tomato sauce have been included in this report, although separately from the two main groups.

Non-dietary variables

This information was collected using a self-administered questionnaire in most countries. Education was categorized into five levels: uncompleted primary school, primary school completed, technical, secondary school, and university degree. Smoking any type of tobacco was used to classify subjects as never, current and former smokers. Physical activity sections consisted of questions on occupational and recreational activities, including cycling; the latter was not available for Norway and Naples. Current job was classified in sedentary, standing, manual, and heavy manual. Total hours per week (h w^{-1}) of recreational activities were computed and categorized into four levels: 0 h w^{-1} , $0\text{--}3.5 \text{ h w}^{-1}$, $>3.5\text{--}7 \text{ h w}^{-1}$, and $>7 \text{ h w}^{-1}$. Height and weight were used to estimate the body mass index (BMI) in the usual way, as weight in kilograms divided by the square height in

meters. In the present analysis, four categories of BMI were considered: subjects with BMI $<20 \text{ kg m}^{-2}$ were classified as “lean”, those with 20–24.99 as “normal”, those with 25–29.99 as “overweight” and those with BMI ≥ 30.00 as “obese”. Further details on the definition and distribution by centre of non-dietary variables are presented elsewhere¹¹.

Data analysis

The crude mean and standard error of the intake in grams per day were calculated for all groups and sub-groups mentioned above. All the analyses were carried out separately for men and women at the centre level. In order to improve the comparability between centres, means with corresponding standard errors adjusted for age, season, and day of week were estimated as well. Although sampling procedures were designed to control for seasonal and day of the week variation, the distribution of these variables was not homogeneous across centres. In the same way, the sample was composed of middle-aged populations but the mean age varied across cohorts. Under “ideal” sampling, all centres should have 25% of subjects interviewed each season. Furthermore, 28.6% of the recalled days should correspond to the weekend (2/7), and 71.4% to a weekday (Monday–Friday). Since sampling was not perfect, subjects were assigned weights to account for over or under-sampling. Weights were calculated for all subjects, in each particular season and weekday combination, as the ratio between the expected frequency under ideal conditions and the actual frequency. To further adjust for age the analysis of covariance was used¹³: a weighted regression model was fitted using the variable of interest as the dependent variable and the variable centre and age as independent covariates, with weights as defined above. The adjusted means reported actually correspond to mean consumption of populations with balanced distribution of interviewed subjects over seasons and between weekend and weekdays, with mean age 56.8 years for men and 55.3 years for women.

To take into account the effect of anthropometric and lifestyle factors, each variable representing such factors (BMI, education, physical activity, smoking) was added into the previous model. The significance was assessed by means of the partial F-test¹³; we also looked at the change in R-square of the model as well as the modification of the centre-adjusted means after including the new variable. Since we were mainly interested in the overall pattern across centres, we also looked at differences in the ranking of mean consumption of V&F after adjustment for each factor.

Results

Consumption of vegetables, overall and for the main sub-groups, for both men and women is shown in Table 2. Among men, there is a clear south-north gradient of total intake of vegetables, with a ratio of 2.6 between Greece and Umeå, the highest and lowest adjusted mean (270 g day⁻¹ vs. 103 g day⁻¹). Two exceptions to this gradient are Asturias, one of the Spanish centres, with a relatively low consumption, and the “health-conscious” population group in the UK, with a high proportion of vegetarians. After adjustment, the highest consumption among women is observed in the south of France; there is also a south-north pattern, but less clearly defined, as some centres in Italy and Spain had low vegetable intake. The highest to lowest ratio is 2.5, comparing 261 g day⁻¹ in the south of France to 103 g day⁻¹ in Asturias, in the north of Spain.

A different picture arises when sub-groups of vegetables are considered. In addition to Table 2, with data by centre, the graphical distribution of vegetable sub-groups is shown in Fig. 1 grouped by countries. Fruiting vegetables are by far the most consumed; in many centres they account for about half of total vegetable intake, ranging from one- to two-thirds in low and high consumers, respectively, with a geographical pattern similar to that

of total vegetables. Leafy vegetables, root vegetables and cabbages have similar proportions overall (10–15%), but they show broad variations and different patterns: while the Mediterranean countries consume a relatively large quantity of leafy vegetables, Scandinavian countries and the UK have the highest proportion of root vegetable consumption, and the UK, the Netherlands and Germany have the highest proportion of cabbage. The intake of onion and garlic is lower than for previous vegetable sub-groups in most countries, led by the southern Spanish centres and Greece in men and women.

Data regarding how vegetables are consumed are shown in Table 3. Mediterranean countries and France consume more vegetables either raw or cooked, both among men and women, taken as absolute values. However, some differences exist when the proportion of total intake is considered: the centres in Norway, Sweden and Germany have the highest proportion of vegetables consumed raw, while in Greece, France, some Italian centres, the UK, and the Netherlands, people tend to consume more cooked vegetables.

The north-south pattern seen for vegetables is even more marked for fruits (Table 4): the ratio between the highest and lowest consumers is 3.7 among men, comparing the adjusted mean of 454 g day⁻¹ in Murcia to 122 g day⁻¹ in Malmö. Among women the ratio is 2.7, comparing 400 g day⁻¹ in Ragusa to 151 g day⁻¹ in Malmö. The difference from vegetable consumption is that Greece and France show an intermediate position for fruit intake. The highest consumption of citrus fruit was observed in Spanish centres, mainly in Murcia, while the Italian centres, mainly Ragusa, lead for intake of other non-citrus fruits.

Although there are striking differences in the amount of fruit consumed, the pattern of consumption is similar in qualitative terms, as can be seen in Fig. 2. The apple is the most consumed fruit in all countries, accounting for approximately 25% of fruit consumption. Only three items account for slightly more than 50% of total fruit intake: in addition to apples, the most consumed fruits in countries with high consumption (Italy and Spain) are

oranges and pears, while bananas and oranges take the second and third place in Northern countries.

Consumption of other food groups of plant origin is shown in Table 5. The Scandinavian and Dutch centres have the highest intake of potatoes and tubers both in men and women. The ratio of consumption is more than three times that of Greece and the southern Italian centres. Legumes are mainly consumed in Spain, and intermediate consumption was observed in Greece and the “health-conscious” cohort in the UK. The German centres had the highest consumption of vegetable and fruit juices by both genders; British men and Dutch women showed high intakes as well. The centres with high intake of fruits, however, reported low consumption of juices. The Italian centres, particularly Ragusa, reported much higher consumption of tomato sauce than any other centre, both among men and women.

Finally, Tables 6 and 7 show the influence of smoking, education, physical activity, and BMI on the mean consumption of vegetables and fruits, respectively. Overall, the factors considered had more influence on the consumption of both groups among women than among men. Regarding vegetables, adjustment produced a modification lower than 1% of the mean intake in most centres, as compared with the mean adjusted for age, season and day of the week (baseline adjustment). Only smoking among men and years of school among women had a more marked influence on the mean consumption, although this did not produce substantial changes in the ranking of centres according to the mean intake. Regarding fruits, the time spent on recreational activities had the highest influence on the mean intake, producing differences in the range 5–10% as compared to the baseline-adjusted mean; centres from Spain, Sweden and Norway were most affected by such an adjustment. However, the overall pattern of consumption, defined by the ranking of centres according to mean fruit intake did not change substantially.

Discussion

Among 27 European centres, we have shown a south-north gradient in the mean intake of total vegetables and fruits in both genders. The ratio between highest to lowest consumers was around 2.5 for vegetables and 3 for fruits. This pattern, however, is not homogeneous for all centres within the countries, nor is it similar for all vegetable sub-groups. Fruiting and leafy vegetables are mainly consumed in southern countries, Scandinavian countries and the UK consume more root vegetables, and Germany and the Netherlands consume more cabbage. The south-north gradient is more evident for fruit consumption, with remarkably high consumption of citrus fruits in southern centres in Spain and fresh fruits other than citrus in southern Italy. Concerning other plant groups, legumes are almost only consumed in the Mediterranean countries while the Scandinavian and Dutch centres have the highest intake of potatoes.

In interpreting our results, several methodological issues must be taken into account. First of all, in most countries we did not study representative population samples¹¹. Methods of recruitment of cohorts were not homogeneous across centres or countries. Generally speaking, we dealt with healthy adult populations from 10 European countries. Cohorts from the Spanish centres, as well as from Turin and Ragusa (Italy) included a high proportion of blood donors. Furthermore, in most countries the centres were selected bearing in mind the main purpose of the EPIC study, namely, the identification of cancer cases. Thus, although for some centres or countries it has been shown that our population has the same characteristics as populations with the same age–sex structure¹⁴, results shown here should not be considered as being representative at the country level.

Regarding the dietary assessment instrument, we used standardized 24-HDR. The principal limitation is that it does not provide a reliable estimate of an individual's usual intake because of day-to-day variations¹⁵. The 24-HDR are also prone to measurement errors, with an overall tendency to under-report total energy. Although it relies on the subject's memory, it is less prone to recall errors than questionnaire methods that refer to usual diet over an extended period in the past. It is especially appropriate for measuring current diet in groups of individuals, and it is particularly suited to assessing group means. In our case the issue of comparability is even reinforced because of highly standardized procedures in its administration^{11,12}. The validity of the group mean intake is also enhanced because of weighting the results to a balanced seasonal and weekday distribution.

Concern about confounding factors is another issue to keep in mind when discussing V&F intake and protective effects, either on cancer or other chronic conditions. It has been suggested that high intake of V&F may simply be a proxy for behaviour patterns with an important impact on disease risk¹⁶. It has been reported that V&F intake and a healthy lifestyle for dietary factors tend to cluster^{17,18}. Particularly relevant is a positive association with high educational level and physical activity, and a negative association with smoking habits. In the present study the three factors mentioned above were correlated with V&F intake, more strongly among women. Although smoking habits, years of school and time spent in recreational activities explained part of the variability in mean V&F intake, modifications of the mean consumption of fruit, with or without adjustment by these factors, were small and were negligible for vegetables. Furthermore, even after taking such adjustments into account, the overall geographical pattern was almost unchanged: although the adjustment modified absolute mean values in some centres, the ranking of consumption remained almost the same. Thus, factors such as physical activity, education or smoking

were not able to explain the large geographical differences in the mean V&F consumption across the EPIC centres.

With these provisos, we can compare our results to V&F intake estimates in similar populations. Consumption of vegetables in our study was slightly higher among men in Sweden, Denmark, the UK, Germany and the Netherlands than estimates based on national dietary surveys¹⁹; the same applies for women, except in Norway and the Netherlands, where our estimates are slightly lower. A similar pattern was observed concerning fruit intake, with some differences: our estimates were remarkably higher in the UK and Germany for both sexes, while we found lower values for men in Sweden and women in Norway. Data on household budget surveys (HBS) for both sexes combined have been reported for Germany, Greece, Norway, Spain, the UK²⁰ and France²¹. Except for Greece and Norway (fruits only), we also found estimates slightly higher for both vegetables and fruit intake. Most HBS are not primarily designed for nutritional purposes; they provide information on food available at the household level, but they lack information on foods eaten away from home and on individuals' consumption within households. HBS and dietary surveys, however, have the advantage of being suited to wide population groups, usually representative at the country level. Interestingly, a dietary survey carried out in Murcia, one of the Spanish centres, using a 24-HDR reported slightly lower estimates than those from the present study for fruits (both sexes) and vegetable intake among women, while men consumed smaller amounts of vegetables in our study²². Apart from differences in the dietary assessment method, other factors that may account for differences are varying age ranges and periods covered. Regarding the USA²³, American men and women aged 40–59 years have an intermediate intake of vegetables as compared with the EPIC countries, but they have much lower fruit consumption: women consumed less than any EPIC country and only Swedish men had lower fruit consumption than men in the USA.

The large variability across centres, particularly at the sub-group level, is one of the most interesting findings of our paper. There seems to be greater heterogeneity on the type of vegetables than for fruits. As already shown, there is a clear south-north gradient, particularly consistent for citrus and non-citrus fruits; this concerns centres where there is a high production of such products. On the other hand, it seems that consumption of juices may be associated with different food habits than V&F consumption. V&F is a very broad category of foods, and until now it is unclear whether some specific vegetables are more important than others²⁴. Thus, the different geographical patterns found for vegetable sub-groups, such as cabbage, root, leafy and fruiting vegetables, must be kept in mind when interpreting results from both descriptive and aetiological studies. In conclusion, we observed a large south-north gradient and large variability in fruit and vegetable consumption among men and women from 27 EPIC centres across Europe. This will provide a good opportunity to study relationships between vegetable and fruit intake and cancer risk.

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Table 3a. Consumption of raw or cooked vegetables in men in 19 centres of the EPIC study
Proportion (%) of total vegetable intake consumed raw or cooked; mean and SE (grams day⁻¹), crude and adjusted by age, season, and day of week.

Country and centre	n	Vegetables, raw				Vegetables, cooked			
		%	Crude Mean	Adjusted		%	Crude Mean	Adjusted	
				Mean	SE			Mean	SE
Greece									
Greece	1312	39.6	104.6	118.9	(3.1)	60.4	159.3	150.8	(3.1)
Spain									
Granada	214	53.5	124.4	118.3	(7.7)	46.7	108.5	104.0	(7.8)
Murcia	243	56.9	150.4	155.1	(7.2)	43.1	113.9	111.7	(7.3)
Navarra	444	41.8	103.0	104.1	(5.3)	58.2	143.5	142.8	(5.4)
San Sebastian	490	50.4	118.4	111.1	(5.1)	52.0	122.3	128.4	(5.2)
Asturias	386	43.6	63.4	68.1	(5.7)	56.4	82.0	82.1	(5.8)
Italy									
Ragusa	168	39.8	69.9	77.5	(8.7)	60.2	105.7	102.1	(8.8)
Florence	271	47.0	98.8	96.7	(6.8)	53.0	111.3	116.1	(6.9)
Turin	677	45.7	115.2	109.5	(4.3)	54.3	136.7	136.6	(4.4)
Varese	328	37.1	66.6	86.4	(6.2)	62.9	112.7	118.5	(6.3)
Germany									
Heidelberg	1033	50.5	87.0	79.8	(3.5)	49.5	85.3	89.8	(3.6)
Potsdam	1235	44.0	64.8	64.3	(3.2)	56.0	82.3	87.0	(3.2)
The Netherlands									
Bilthoven	1024	30.5	41.4	35.6	(3.6)	69.5	94.2	101.1	(3.7)
United Kingdom									
UK General population	404	31.0	48.8	52.8	(5.6)	69.0	108.7	108.0	(5.7)
UK "Health conscious"	114	36.2	79.7	78.5	(10.5)	63.8	140.5	146.9	(10.7)
Denmark									
Copenhagen	1356	49.0	69.2	73.8	(3.0)	51.0	72.0	73.8	(3.1)
Aarhus	567	37.9	49.6	53.4	(4.7)	62.1	81.3	80.8	(4.8)
Sweden									
Malmö	1421	51.3	61.1	68.3	(3.1)	48.7	58.0	51.9	(3.2)
Umeå	1344	65.4	68.4	67.4	(3.0)	34.6	36.1	36.0	(3.1)

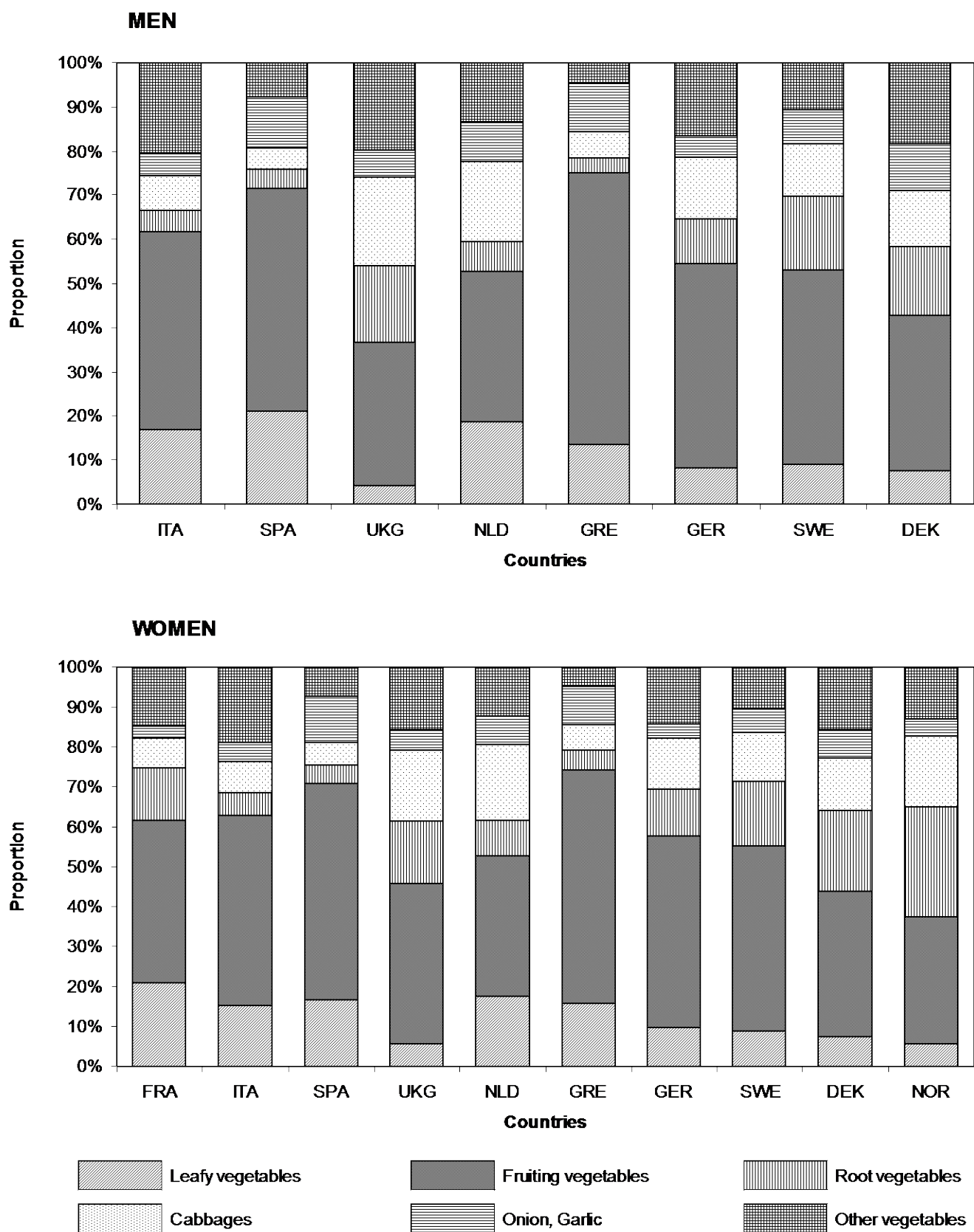
Table 3b. Consumption of raw or cooked vegetables in women in 27 centres of the EPIC study
Proportion (%) of total vegetable intake consumed raw or cooked; mean and SE (grams day⁻¹), crude and adjusted by age, season, and day of week.

Country and centre	n	Vegetables, raw				Vegetables, cooked			
		%	Crude Mean	Adjusted Mean	SE	%	Crude Mean	Adjusted Mean	SE
Greece									
Greece	1374	37.8	78.8	83.5	(2.7)	62.2	129.9	123.5	(2.9)
Spain									
Granada	300	55.4	127.5	113.8	(5.8)	45.1	103.7	103.2	(6.2)
Murcia	304	48.0	121.6	119.9	(5.8)	52.0	131.6	133.5	(6.2)
Navarra	271	45.9	89.2	89.5	(6.2)	54.1	104.9	106.5	(6.5)
San Sebastian	244	42.1	91.7	89.3	(6.5)	59.9	130.6	127.1	(6.9)
Asturias	324	51.0	53.5	51.8	(5.6)	49.0	51.5	51.5	(6.0)
Italy									
Ragusa	138	37.9	55.4	52.6	(8.6)	62.1	90.6	85.7	(9.2)
Naples	403	30.4	51.1	58.3	(5.0)	69.6	116.7	115.3	(5.4)
Florence	785	44.0	85.9	86.3	(3.6)	56.0	109.3	110.9	(3.8)
Turin	392	43.1	101.0	101.3	(5.1)	56.9	133.2	132.5	(5.4)
Varese	794	46.8	78.0	73.2	(3.6)	53.2	88.7	86.8	(3.8)
France									
South coast	612	37.1	84.1	101.8	(4.1)	62.9	142.4	159.1	(4.3)
South	1396	38.3	84.6	83.0	(2.7)	61.7	136.5	135.1	(2.9)
North-west	622	41.9	80.9	88.6	(4.0)	58.1	112.1	120.1	(4.3)
North-east	2009	38.9	83.9	85.6	(2.2)	61.1	131.9	129.6	(2.4)
Germany									
Heidelberg	1087	51.1	87.0	77.9	(3.1)	48.9	83.3	87.5	(3.3)
Potsdam	1063	56.9	99.5	88.1	(3.1)	43.1	75.3	79.0	(3.3)
The Netherlands									
Bilthoven	1086	40.7	53.6	48.2	(3.1)	59.3	78.1	80.1	(3.3)
Utrecht	1874	33.7	44.4	45.1	(2.3)	66.5	87.6	86.8	(2.5)
United Kingdom									
UK General population	571	40.4	66.7	64.7	(4.2)	59.6	98.6	99.0	(4.5)
UK "Health conscious"	197	42.5	93.9	94.7	(7.2)	57.5	127.0	125.4	(7.7)
Denmark									
Copenhagen	1485	53.9	79.4	82.3	(2.6)	46.2	68.1	67.8	(2.8)
Aarhus	510	51.9	75.4	79.7	(4.5)	48.1	70.0	69.6	(4.8)
Sweden									
Malmö	1711	59.6	75.1	80.2	(2.5)	40.4	50.9	50.3	(2.6)
Umeå	1574	69.7	85.6	85.8	(2.5)	30.3	37.2	36.7	(2.7)
Norway									
South & East	1136	56.6	74.1	72.7	(3.0)	43.4	56.9	58.0	(3.2)
North & West	662	47.8	57.1	55.0	(4.0)	52.2	62.4	63.3	(4.2)

Figure 1. Consumption of vegetables by subgroups in the EPIC countries

Figure 2. Consumption of fruits in the EPIC countries: ranking according to the amount consumed

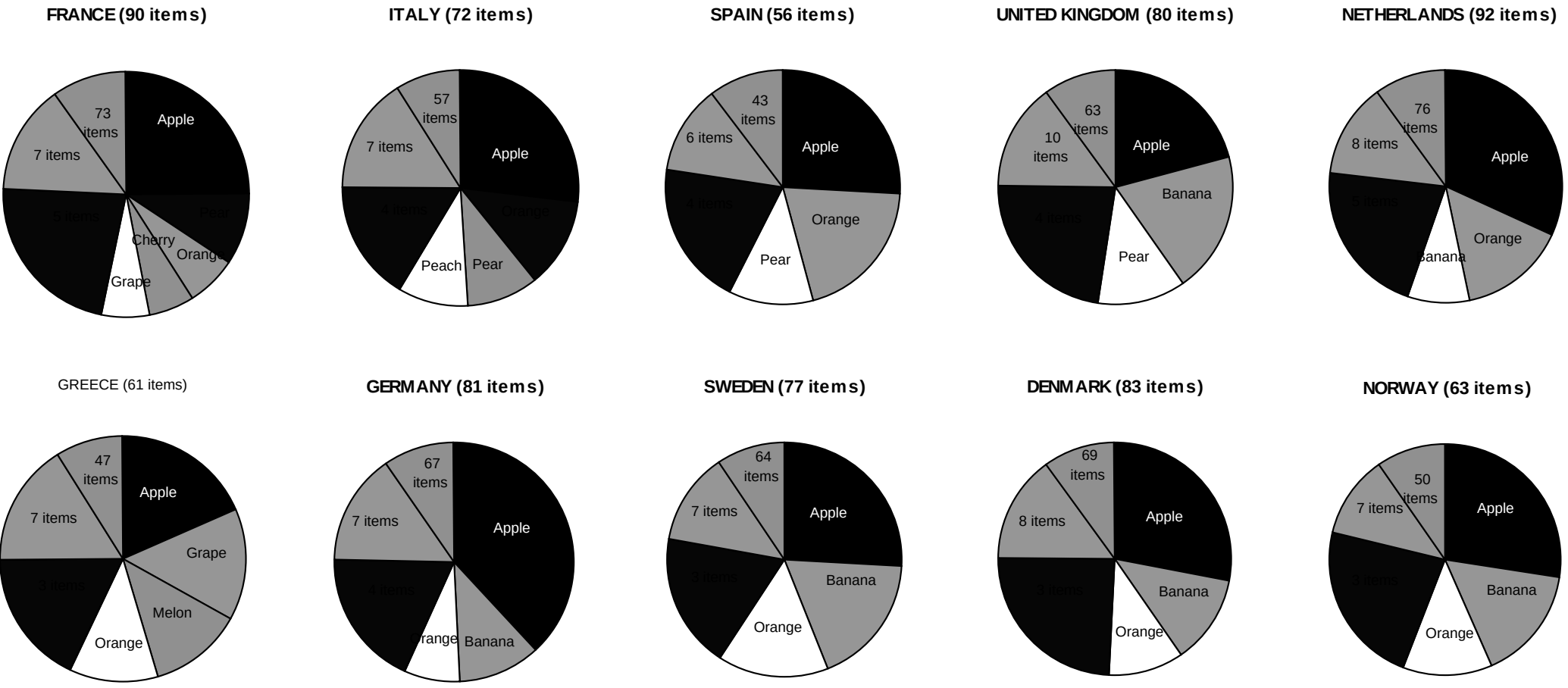
Figure 1. Consumption of vegetables by sub-groups in the EPIC countries



Other vegetabes includes: mushrooms, grain and pod vegetables, stalk vegetables and sprouts, mixed, and unclassified.

FRA: France, ITA: Italy, SPA: Spain, UKG: Uniteg Kingdom (general population), NLD: The Netherlands, GRE: Greece, GER: Germany, SWE: Sweden, DEK: Denmark, NOR: Norway.

Figure 2. Consumption of fruits in the EPIC countries: ranking according to the amount consumed



In each country individual values are shown only for fruits accounting for at least 50% of total fruit intake (or the nearest higher value). Then, three groups are presented separately, indicating only the number of items contributing up to 75%, 90% and 100% of total fruit consumption, respectively. Numbers in parenthesis after the country name indicate the total number of different items reported.

FRANCE: apple 25%, pear 9%, orange 6%, cherry 6%, grape 6%; ITALY: apple 26%, orange 12%, pear 10%, peach 10%; SPAIN: apple 26%, orange 20%, pear 12%; UK: apple 21%, banana 19%, pear 12%; NETHERLANDS: apple 32%, orange 15%, banana 9%; GREECE: apple 18%, grape 14%, Melon 12%, orange 12%; GERMANY: apple 38%, banana 11%, orange 7%; SWEDEN: apple 26%, banana 18%, orange 15%; DENMARK: apple 29%, banana 12%, orange 10%; NORWAY: apple 27%, banana 16%, Oorange 12%.