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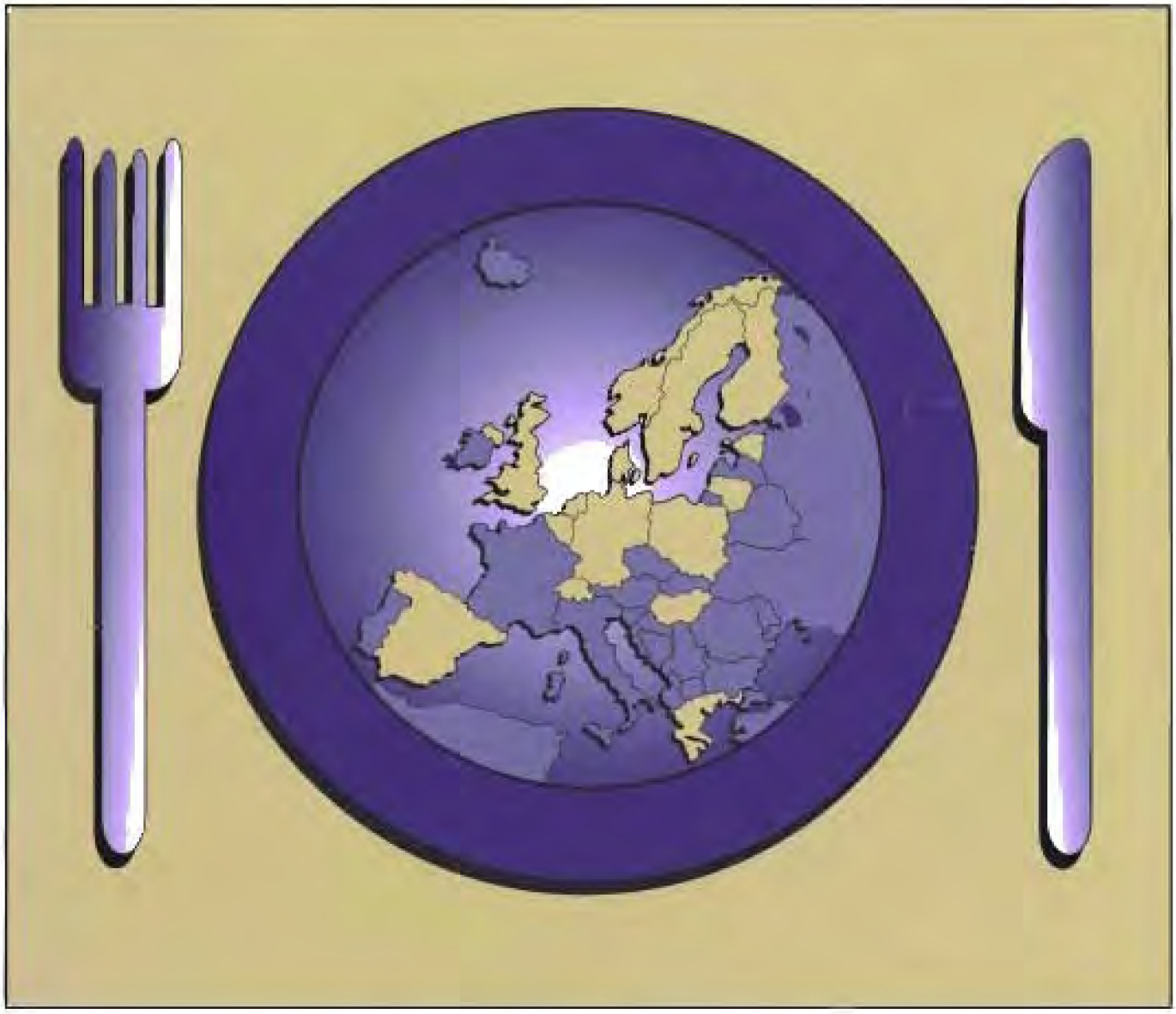
Gun Roos • Ritva Prättälä
FAIR-97-3096 Disparities group (tasks 4 and 5)

DISPARITIES IN FOOD HABITS

Review of Research io 15 European Couotries



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Compatibility of the Household and IndividuaJ Nutrition
Surveys in Europe and Disparities in Food Habits

Helsinki, Finland 1999

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Kansanterveyslaitos
Epidemiologian ja terveyden edistämisen osasto
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Preface

This report presents the main results of the Disparities part (tasks 4 and 5) of the EU-sponsored concerted action project FAIR-97-3096 "Compatibility of the Household and Individual Nutrition Surveys in Europe and Disparities in Food Habits" (see Appendix 1 for a flow chart of the project tasks). The objective of this effort was to compare socioeconomic differences in food habits across European countries. The results of the "Compatibility" part are presented elsewhere.

The report is based on the following unpublished working papers, which have been produced as part of the project and have been distributed to those who have participated and provided information:

- Bibliography: Disparities in food habits 1987-1997 (Appendix 3).
- Identification of data sources for disparities in food habits in Europe. An analysis made on the basis of questionnaires returned by 27 researchers (Appendix 4).
- Short review of how socio-economic status has been measured in health related studies.
- Disparities in food habits table (characteristics, methods and results from relevant studies).

This document is the main publication of the Disparities part (tasks 4 and 5). It contributes to the literature on public health nutrition and is written for researchers and educators, health and nutrition policy makers and administrators, as well as food manufacturers and retailers.

September 1999

The authors

Acknowledgements

Essential for this project was the willingness of researchers in the different countries to provide information and data from national surveys.

The Disparities part (tasks 4 and 5) of the FAIR-97-3096 "Compatibility of the Household and Individual Nutrition Surveys in Europe and Disparities in Food Habits" held three workshops. The first at ICFSN - Nutrition in Gent in 1998, the second at the National Public Health Institute in Helsinki in 1999 and the third at University of Oslo in 1999. Apart from the members of the FAIR-97-3096 Disparities group, the following persons (in alphabetical order) have participated in one or more of these workshops: Miguel Delgado-Rodríguez (Spain), Helene Eeckman (Belgium), Sharon Friel (Ireland), Ville Helasoja (Finland), Andrus Lipand (Estonia), Sophia Paterakis (United Kingdom), Janina Petkeviciene (Lithuania), Eva Roos (Finland), Piet van Stratum (Netherlands), and Helena Tuomainen (Finland).

In addition to the members of the FAIR-97-3096 Disparities group, the following persons (in alphabetical order) have provided information: Aurelio Barricarte (Spain), Wulf Becker (Sweden), Eric Brunner (United Kingdom), Jadwiga Charzewska (Poland), Dimitra Gefou-Madinou (Greece), Marta González-Villar (Spain), Satu Helakorpi (Finland), Kamelija Kadziauskiene (Lithuania), Georg Karg (Germany), Anton Kunst (Netherlands), Barbara Köhler (Germany), Pagona Lagiou (Greece), Juan Llopis (Spain), Isabel López-Azpiazu (Spain), Olga Moreiras (Spain), Merete Osler (Denmark), Sophia Paterakis (United Kingdom), Aileen Robertson (Denmark), Eva Roos (Finland), Daniela Schlettwein-Gsell (Switzerland), Luis Serra-Majem (Spain), Gertrud Winkler (Germany), and Gábor Zajkás (Hungary).

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The authors

SUMMARY

Socioeconomic inequalities in health vary in Europe. The contribution of differences in food behaviour to these inequalities is not yet well understood.

This report which is part of the FAIR-97-3096 project "Compatibility of The Household and Individual Nutrition Surveys in Europe and Disparities in Food Habits" aims at providing a comprehensive overview of existing data sources on socioeconomic differences in food habits in Europe in 1985-1997. An additional aim is to give a description of the similarities and differences (homogeneity and heterogeneity) in the patterns of food-related disparities. The link between food behaviour and health inequalities is also referred to. The underlying hypothesis of the project is that socioeconomic status affects the healthiness of the diet.

The main tasks for the compilation of this report were 1) to identify data sources and 2) to integrate the findings on disparities in food habits. The main methods for completing these tasks were literature searches, two questionnaires mailed to researchers, systematic qualitative analysis, and meta-analysis. Altogether 47 researchers from 16 different countries were contacted. The literature searches and information from researchers on references and relevant studies resulted in a bibliography on disparities in food habits with 165 references. No large-scale European studies comparing educational and/or occupational differences in food habits in different age and gender groups were identified. However, at present there are some initiatives, such as the DAFNE project and the EPIC study, which allow the estimation of individual food availability in socioeconomic groups in selected countries.

The final operational definition of disparities in food habits as well as the central principles of classifying and ranking the chosen studies were the outcome of consulting several information sources, i.e. previous scientific literature, results of the two questionnaires to the researchers, as well as discussions and teamwork that took place in the meetings of the FAIR-97-3096 project. The following definition was agreed upon:

Disparities in food habits are defined as the differences in food consumption based on education and/or occupation among adult men and women. Food consumption is measured as quantity or frequency of consumption of the following food items or groups: fruits, vegetables, fats and oils (added lipids), meat and dairy.

In addition to differences in food consumption, it is highly recommended to include differences in meal frequency and energy yielding nutrients.

Disparities can optionally be reported based on region, ethnic group, urban/rural area, religion, income and employment status. Disparities in food-related values, attitudes and beliefs or additional food items or groups (fish, alcoholic beverages and food supplements) may be included.

For a study or published report to be included in the systematic analysis it had to fulfil the following basic criteria: 1) The subjects had to be adults (18-65 years), and 2) the period of a study (data collection) had to be 1985-1997. In addition, selected variables were obligatory (education and/or occupation, age, gender and food groups/items), highly recommended (energy yielding nutrients and meal frequency), and optional (region, ethnic group, urban/rural area, religion, income, (un)employment, food-related values, attitudes, beliefs, fish, alcoholic beverages and food supplements).

Finally, 47 studies from 15 countries were selected. The following regions and countries were represented: the North (Denmark, Finland, Norway, Sweden); the South (Greece, Spain); the West (Belgium, Germany, Netherlands, Switzerland, United Kingdom); and the East (Estonia, Hungary, Lithuania, Poland). The identified studies were mainly large-scale national dietary, household budget and health behaviour surveys. The number of studies for which results were presented is smaller (n = 33). One study was left out because it did not fulfil the collectively agreed methodological criteria. In addition, the results of studies that have been repeated annually or biannually were combined. The final group of studies was then integrated by systematic qualitative analysis and meta-analysis.

In the qualitative analysis each study was taken at face value and common conclusions were identified. The studies were divided into three groups based on their types of methods and data. The largest group included 13 dietary surveys. Household budget surveys formed a group with 9 studies. The third group consisted of 11 studies, which were mainly based on health behaviour surveys. Because the studies were heterogeneous and used various methods, the separate meta-analysis was possible for only a small part of the identified studies: 9 studies qualified for the preliminary analysis presented in this report.

The main results of the analyses are:

- There are data available on socioeconomic differences in food consumption and nutrient intake, but very limited data on meal patterns. The scattered and heterogeneous nature of available data limits comparison.
- The results of the qualitative analysis and meta-analysis support with some exceptions that people belonging to higher social classes have healthier diets. Those with higher education, with the exception of the South, tend to consume more vegetables and fruits and less fats and oils. However, they also eat more cheese.
- The socioeconomic differences in food consumption are not homogenous across Europe. The patterns vary by food group and region.

This review shows that there are only a few studies focusing specifically on socioeconomic differences in food habits in Europe and that the heterogeneity of the available data limits the possibilities for in-depth analysis. There is especially a lack of information on meals although

knowledge about these is important for the understanding of food habits. To obtain a better understanding of the disparities in food habits across Europe it would be useful, in addition to further exploring existing data, to collect new comparable data on socioeconomic differences in food habits in relation to other health behaviour.

The nature and magnitude of food-related disparities should be taken into account in planning food and nutrition policies and dietary interventions aimed at promoting health among underprivileged population groups. The differences in the patterns of food disparities between regions need to be considered when efforts to improve nutrition and health among risk groups are planned.

1. INTRODUCTION

1.1. Background

Since the 1980s health inequality has become a topic of debate and research in Europe (Marmot 1991, Macintyre 1997, Mackenbach et al. 1997, Whitehead 1997). The existence of socioeconomic inequalities in health is well documented. It has been demonstrated that those who are poorer, have lower educational levels and less advantageous occupational status are also disadvantaged in health and life expectancy (Valkonen 1989, Kunst 1997). The size and pattern of health inequalities vary in Europe. A recent international comparison showed that socioeconomic differences in morbidity and mortality were larger in some European countries (including Scandinavian countries and the Netherlands) than in others (including Germany, Switzerland, Spain) (Kunst et al. 1996, Mackenbach et al. 1997). In Northern countries, cardiovascular diseases were the main contributor to the difference in mortality (Kunst et al. 1996, Mackenbach et al. 1997). Women have lower mortality rates than men and the socioeconomic inequalities in health have also been smaller among women. In several Western European countries socioeconomic status mortality differentials appear to have widened since the 1960s especially among men (Valkonen 1989, Kunst 1997).

The level of inequality in material resources within a society has often been presented as a major cause of health inequality (Blaxter 1990, Whitehead 1992, Cavelaars 1998). The living and working conditions of those belonging to lower social groups expose them to greater health hazards. Variations in health inequalities have mainly been explained by differences between countries' welfare policies and living standards. However, a recent international comparison on variations in the size of educational-related inequalities in self-reported morbidity showed unexpectedly that inequalities were not smaller in the Northern countries with more egalitarian policies than in the rest of Europe (Kunst et al. 1996).

In addition to structural explanations, inequalities have been attributed to cultural, behavioural and psychosocial factors (Blaxter 1990, Whitehead 1992, Cavelaars 1998). Those belonging to disadvantaged social groups have been said to have riskier behaviour and less interest in their future health than those belonging to more advantaged social groups. Social groups may behave according to their own conceptions of what is suitable and appropriate for them to distinguish themselves (Bourdieu 1989).

The role of the differences in behaviour including food behaviour and lifestyle in different social groups is not yet well understood (Davey Smith and Brunner 1997). Studies have shown that people from higher social classes in general have more health-conscious behaviours than those from lower social classes (Blaxter 1990, Hulshof et al. 1991, Whitehead 1992, Lahelma et al. 1997a, Cavelaars 1998). However, there may be exceptions. For example, a study among Finnish adults showed that the longer the education, the better the health and the more favourable the health behaviour, except for the use of alcohol. Alcohol consumption was more prevalent among those with a higher educational level (Lahelma et al. 1997a).

Social and economic changes during the past 10 years in Europe have resulted in greater health inequality and unexpected pockets of poverty even in earlier welfare countries such as Finland, Sweden and Denmark. Because food behaviour may contribute to explanations of differences, a similar trend in food-related disparities would be expected. Although at present there are some European initiatives to record food availability/consumption at a European level, such as the DAFNE project and the EPIC study (Trichopoulou et al. 1996, Riboli et al. 1997, Trichopoulou and Lagiou 1997, 1998), current research evidence is limited and information on trends in food disparities is available in only a few countries (Prättälä et al. 1992). Cross-sectional studies in some European countries have shown that those belonging to higher social classes tend to have healthier diets and consume more vegetables (Hulshof et al. 1991, Marmot et al. 1991, Osler 1994, Prättälä 1995, Roos 1998, Johansson et al. 1999). Few studies have attempted to explain the differences. Different energy needs, cultural and social factors have been suggested as causes (Hulshof et al. 1991, Karisto et al. 1993, Davey Smith and Brunner 1997). A higher educational level is associated with healthier diets and with better knowledge about the concept of healthy diet (Roos et al. 1996, Margetts et al. 1997, Martinez-Gonzalez et al. 1998). Poverty and low income may also restrict the ability to buy and limit the access to healthy foods (Dowler 1997, James et al. 1997). In addition to socioeconomic factors, other determinants such as gender and age also affect food behaviour. Women tend to have healthier food behaviour than men (Anderson and Hunt 1992, Prättälä et al. 1992, Prättälä 1995).

This report aims at providing a comprehensive overview of existing data sources on socioeconomic differences in food habits in Europe in 1985-1997. An additional aim is to give a description of the similarities and differences (homogeneity and heterogeneity) in the patterns of food-related disparities. The usefulness of existing data sources for comparing food habits between socioeconomic groups within and across countries is discussed. The link between food behaviour and health inequalities is also referred to.

This document is structured as follows: the introduction, Chapter 1, presents demographic and statistical information of the target countries and the objectives of the study. Chapter 2 provides a description of the various methods used for the identification and analyses of the studies. Chapter 3 presents the identified material. The following chapter, Chapter 4, describes socioeconomic differences in food habits. In Chapter 5, the methods are evaluated and the main

results are discussed. The report concludes with a discussion of potential areas for further research and recommendations to policy makers (Chapter 6).

1.2. Socio-demographic conditions and food consumption in target countries

The goal of this study was to obtain information from as many countries as possible representing all regions of Europe. Studies from the following regions and countries were included: the North (Denmark, Finland, Norway, Sweden); the South (Greece, Spain); the West (Belgium, Germany, Netherlands, Switzerland, United Kingdom); and the East (Estonia, Hungary, Lithuania, Poland).

European societies differ in many respects. The population sizes in the countries included varied in 1997 from 1.5 million in Estonia to 82.1 million in Germany (Table 1). The economy measured in Gross National Product (GNP) in European countries was highest in Switzerland, Norway and Denmark, and lowest in Estonia, Lithuania, Poland and Hungary (Table 1).

Table 1. Population, GNP and life expectancy in target countries.

Country	Population 1997 Mill.	GNP/ Inh 1997 US $ 1000	Life expectancy at birth, 1996 Males	Females
Norway	4.4	35	75	81
Finland	5.1	23	73	81
Sweden	8.8	26	77	82
Denmark	5.3	32	73[1)]	78[1)]
United Kingdom	59.0	22	74	79
Germany	82.1	26	73[2)]	80[2)]
Netherlands	15.6	26	75	80
Belgium	10.2	24	74	81
Switzerland	7.1	36	76	82
Estonia	1.5	3	65	76
Lithuania	3.7	3	65	76
Poland	38.6	4	68	77
Hungary	10.2	4	66	75
Spain	39.3	14	73	81
Greece	10.5	12[3)]	75	80

[1)] Data from 1995
[2)] Data from 1994-96
[3)] Data from 1996

Source: United Nations 1999

Table 2. Adult population (25-64 years) according to educational level (ISCED = International Standard Classification of Education) in selected European countries.

Country	Low[1] %	Middle[2] %	High[3] %	Total %	Population 25-64 yrs. Millions
Norway	19	53	29	100	2.2
Finland	35	45	21	100	2.8
Sweden	25	46	28	100	4.5
Denmark	38	42	20	100	2.8
United Kingdom	24	54	21	100	30.4
Germany	16	61	23	100	46.4
Netherlands	39	39	22	100	8.5
Belgium	47	29	25	100	5.4
Switzerland	18	61	21	100	3.9
Spain	72	12	16	100	18.0
Greece	57	25	17	100	5.5

[1] ISCED 1 / 2 = Primary or lower secondary
[2] ISCED 3 = Upper secondary
[3] ISCED 5 / 6 / 7 = Third level

Source: Havén 1998, OECD 1997

A comparison of educational levels among 25-64-year-olds in Europe by Havén shows that the level of education is in general higher in the North than in the South[1] (Table 2).

According to statistics compiled by the World Bank (Table 3) household expenditure on food in relation to total private consumption per capita varies from 10% to 28% in the countries of interest (no information for the Baltic countries). Expenditure on food tends to be lower in the North (10-13%) and the West (11-15%) than in the South (17-28%) and the East (14-20%). Information on the variation in household expenditure based on socioeconomic status is limited. An analysis in the UK showed that in 1988 white-collar workers spent a low percentage of their total income on food. The different social classes also spent their money on different types of food. Working class people spent more on bread, sausages, cooked meats, beer, fish and chips, sugar, tea and canned vegetables, and less on fresh vegetables, processed and fresh fruit, wine and meals out (Warde 1997).

The health of the population in Europe has improved from the 1960s. Life expectancy has increased with the exception of men living in Eastern Europe (Nomesco 1998). Chronic diet-related diseases such as cancers and cardiovascular diseases are the most important causes of death.

[1] The table gives a rough picture of the situation in Europe. For example, another source of information (Eurostat 1999) suggests that for some countries, such as Spain, Belgium and Denmark, the proportion of people who have completed at least upper secondary level (Middle) is higher than presented in the table.

Table 3. Household expenditure on food and education in European countries, 1997.

Country	Private consumption[1] Per capita PPP[2]	Household consumption[3] All food %	Education[4] %
Norway	14 741	13	11
Finland	13 353	11	11
Sweden	13 583	10	9
Denmark	16 214	10	13
United Kingdom	15 490	11	8
Germany	15 229	11	6
Netherlands	14 535	11	8
Belgium	15 579	15	11
Switzerland	16 728	12	8
Poland	5 087	20	19
Hungary	5 372	14	17
Spain	10 667	17	8
Greece	9 315	28	6

[1] Private consumption includes the consumption of individuals, households, and non-governmental organisations.
[2] PPP = purchasing power partities. These measure the relative purchasing power of different currencies over equivalent goods and services. PPPs allow the comparisons of the real value of consumption expenditures between countries.
[3] Household consumption shows the percentage shares of selected components of consumption computed from details of GDP (GNP) converted using PPPs.
[4] Education includes government as well as private expenditures.

Source: World Bank 1999

Health inequalities are common in Western Europe according to a recent comparative study of socioeconomic inequalities in morbidity and mortality (Kunst et al. 1996, Mackenbach et al. 1997). Morbidity rates were found to be higher among lower socioeconomic groups. The relative inequalities in morbidity were larger than average in Sweden, Norway and Denmark, and smaller in Germany, Switzerland and Spain. Finland, Great Britain and the Netherlands were in the middle. Lower socioeconomic groups were also found to have higher mortality rates. Differences between countries were observed in the pattern of these inequalities by socioeconomic indicator, cause of death and risk factor for disease (Kunst et al. 1996). In countries with more egalitarian socioeconomic, health care and other policies, such as the Scandinavian countries and the Netherlands, relative inequalities in morbidity and mortality were not smaller and may even have been somewhat larger than in other countries, such as Germany, Switzerland and the southern part of Europe (Mackenbach et al. 1997).

To give a general picture of food consumption patterns in Europe we present food balance sheet data for the countries of interest (Appendix 2, Table 2.1.). FAO's food balance sheets (FAO 1999), which illustrate annual food supply per capita in most countries in the world, have been used in international comparisons (Becker and Helsing 1991). However, the accuracy of the data varies between food groups and countries. For example, a comparison of food balance sheets in Nordic countries showed that data on milk and milk products, meat and meat products

were considered to be relatively accurate and comparable, whereas those for vegetables and fruits were less comparable (Becker and Enghardt 1993). In some countries food production may affect the data. For example, in Lithuania production within the households is important and food is often bought at markets. However, these may not have been taken into account in the food balance sheets. Despite their limitations, food balance sheets are considered to be a standardised source of information.

Based on FAO food balance sheet data (FAO 1999) there seems to be a North-South pattern in food use in Europe (Appendix 2, Table 2.1.). Vegetable, fruit and vegetable oil (olive oil in particular) consumption is high and the use of animal fats low in the South. From 1985 to 1996 Greece had clearly the highest use of vegetables and pulses (220-239 kg/person/year). Spain also had high rates (>140 kg/person/year). Consumption of vegetables has increased in the North but is still much lower than in the South. The lowest consumption numbers were found in Estonia, Lithuania, Finland, Norway and Sweden (variation between countries in 1993-96: 50-70 kg/person/year)

Fruit use was also highest in Greece (186-205 kg/person/year). Spain, Switzerland, Belgium-Luxembourg, the Netherlands, Germany and Norway had rates >100 kg/person/year. Fruit consumption was clearly lowest in Estonia, Poland and Lithuania (variation between countries in 1993-96: 41-51 kg/person/year).

Greece and Spain had the highest use of vegetable oils. The lowest use was found in Lithuania, Estonia, Denmark and Finland. Denmark and Belgium-Luxembourg had the highest use of animal fats, Greece and Spain the lowest. The use of butter was highest in Germany, Finland, Belgium-Luxembourg and Switzerland (>6 kg/person/year). The lowest butter use was found in Spain, Greece, Hungary, and the Netherlands (<2 kg/person/year). In countries with high intakes of vegetable oils the proportion of fats from vegetable sources has been fairly constant between 1985 and 1996 (Appendix 2, Table 2.2.). In many of the countries that have had lower intakes of fat from vegetable sources the proportion has increased.

Milk consumption was high in Finland, Sweden, Netherlands, Switzerland, Norway and Estonia (>250 kg/person/year). The lowest use was found in Lithuania (155 kg/person/year).

The use of meat and offal has been high in Denmark and Spain (>100 kg/person/year). Low use has been reported in Estonia and Lithuania (<60 kg/person/year) and Finland, Sweden and Norway (60-70 kg/person/year).

In conclusion, there are some regional differences in social conditions and food consumption in Europe. The small countries in the North have high levels of education. However, the inequalities in health are larger than in the West and the South. Typical for the food consumption in the North are low consumption levels of vegetables, vegetable oil and meat, and high consumption of milk. In the South the GNP and level of education are lower than in the North and the West, whereas the consumption of vegetables, fruits and vegetable oils is high.

The West includes countries with large populations and middle levels of education. Food intake shows some variation, but food consumption rates usually fall in between those of the North and the South. In the East life expectancy among men is much lower than in other regions. Fruit and vegetable consumption is low especially in the Baltic countries.

1.3. Objectives and research questions

The Disparities part (tasks 4 and 5) of the FAIR-97-3096 project "Compatibility of the Household and Individual Nutrition Surveys in Europe and Disparities in Food Habits" aimed at comparing, with the help of existing data sources, food-related socioeconomic differences in European countries. The underlying hypothesis was that socioeconomic status affects the healthiness of the diet.

The objective was translated into the following research questions:

1. **Are there research data on socioeconomic differences in food habits and nutrient intake in Europe?**
2. **Do those belonging to higher social classes have healthier diets?**
   - Are there socioeconomic differences in the consumption of the main health-related foods and/or nutrients?
   - Are the socioeconomic differences homogeneous across European countries?

2. MATERIAL AND METHODS

The main tasks of the study were 1) to identify data sources and 2) to integrate the findings on disparities in food habits. The methods used to perform these tasks are summarised in the flow chart (Figure 1) and are described in more detail below. Three workshops were arranged to discuss measurement and methodological issues and interpret preliminary results. In addition to their input at the workshops and project plenary meetings, participants were asked by mail to provide material and give comments.

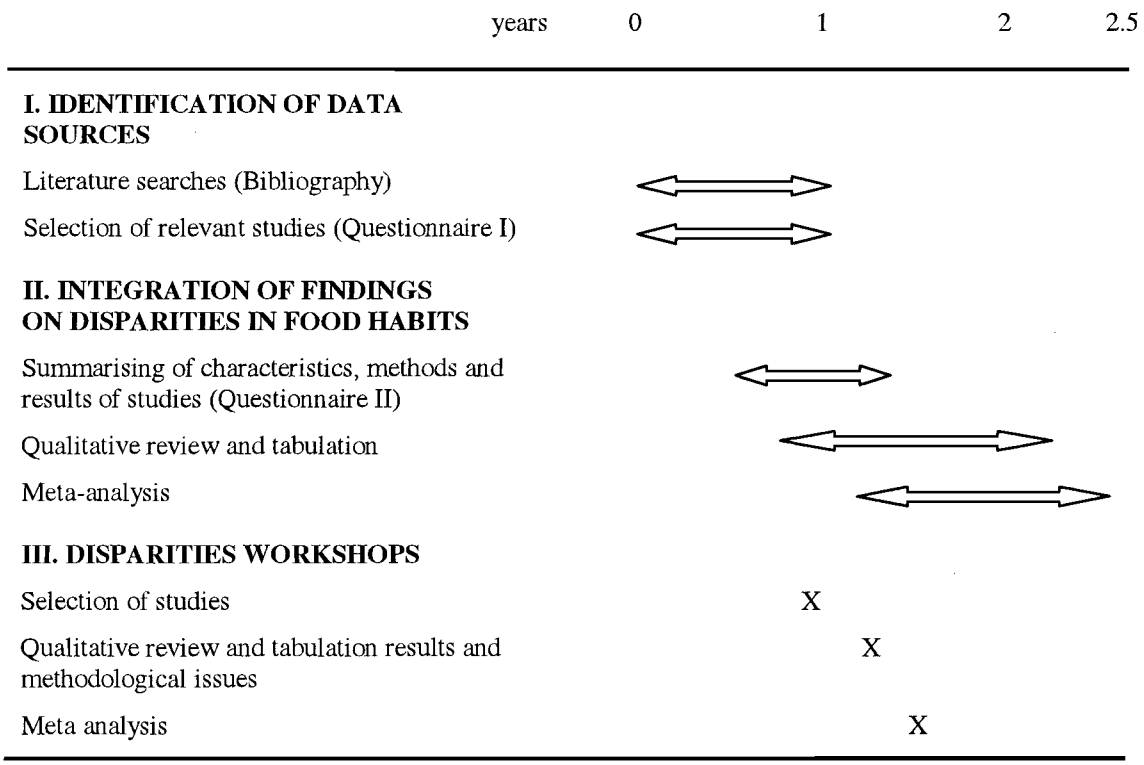

Figure 1. "Disparities in food habits" tasks and activities.

2.1. Identification of studies

The two main methods for identifying relevant studies were literature searches, which resulted in a bibliography, and a questionnaire mailed to researchers.

2.1.1. Literature searches (Bibliography)

The purpose of the literature searches was to identify relevant studies and to explore if there are large-scale comparative studies on the nature and magnitude of educational and/or occupational differences in food habits in Europe. The searches were limited to the years 1987-97[1].

The literature searches and information from researchers on references and relevant studies resulted in a bibliography on disparities in food habits. Details of the literature search methods and results are described in Appendix 3. Key words used in the literature searches were developed based on the objectives of the study and discussions among the participants. Several key words were used for disparities (socioeconomic status, education, occupation, social class, income, employment, poverty, gender, region, etc.) and for food habits (food, meal, nutrients, nutrition, diet, eating, etc.). References were located by searching electronic databases, such as Medline, Database UnCover, Social Science Search, Social Science Citation Index and Nutrition Abstracts. The searches were performed to identify relevant European research focusing on the 11 participating European countries (Belgium, Denmark, Estonia, Finland, Germany, Greece, Lithuania, Norway, Spain, Sweden, and United Kingdom). The searches were supplemented by contacting European researchers and by consulting documentation centres, books and journals. Researchers answered a questionnaire (described below in section 2.1.2.) in which they were asked to provide information on key references, relevant studies and names of other researchers in the field.

The final bibliography compiled in October 1998 included 165 references. No large-scale studies comparing educational and/or occupational differences in food habits in different age and gender groups in Europe were identified. The DAFNE project (Trichopoulou and Lagiou 1997, 1998) included estimates of individual food availability with a breakdown by educational level in 6 countries. The bibliography comprised a few small-scale comparative studies (Prättälä 1995, Hupkens et al. 1997), and a small number of larger ones that have taken some aspects of food disparities into account (Cavelaars 1998, Hupkens 1998). After the final bibliography was compiled, some European initiatives, such as the EPIC and FINBALT studies, have provided relevant information on food habits (Agudo et al. 1999, Prättälä et el. 1999).

[1] Publications known to be in press at the time of the literature search were also included

2.1.2. Questionnaire to researchers (Questionnaire I)

The aims of the first questionnaire to researchers (Appendix 4) were to specify the definition of disparities in food habits and to develop a record of references, relevant data sources and individual research interests. The questionnaire was mailed to the members of the Disparities group at the beginning of the project (1997). They were asked to provide names and contact addresses for other researchers they know who are interested in disparities in food habits and to whom the questionnaire could be mailed ("snowball sampling"). In addition to the initial 11 members, 36 researchers from 16 different countries were contacted (1998). The questionnaire mailed to these people was a modified version of the original one: it did not include all the specific questions related to the goals and expectations of the Disparities study.

2.1.3. Definition of disparities in food habits

The definition of "disparities in food habits" used in the study was developed based on the aims of the project, earlier literature (Prättälä 1995, Kunst et al. 1996, Trichopoulou and Lagiou 1997, Roos 1998), responses from researchers and discussions among participants.

The questionnaire to researchers contained a working definition of disparities in food habits and respondents were asked to indicate what aspects they would include under disparities in food habits (Questionnaire I, Appendix 4; Respondents of Questionnaire I, Appendix 5). Of the predetermined options, the majority of researchers included educational level, occupational status and gender (Table 4). In addition, respondents added a variety of other variables, such as age, household composition and income. All researchers included food patterns under food habits and meal patterns were also commonly included (Table 4). Nutrients were less often considered to be part of food habits.

Table 4. Suggestions on what to include under "disparities" and "food habits".

	Researchers (n = 27)		Researchers (n = 27)
DISPARITIES		**FOOD HABITS**	
Educational level	25	Food patterns	27
Occupational status	25	Meal patterns	24
Gender	24	Nutrients	16
Region	23	Values, attitudes, beliefs	2
Ethnic group	22	Other[1)]	7
Age	13		
Household/Family size and composition	9		
Income	9		
Urban/rural area	6		
Religion	4		
Employment status	2		
Other[1)]	12		

[1)] Each suggestion included in "other" was not mentioned more than once.

The final operational definition of disparities in food habits used in this study was as follows:

Disparities in food habits are defined as the differences in food consumption based on education and/or occupation among adult men and women. Food consumption is measured as quantity or frequency of consumption of the following food items or groups: fruits, vegetables, fats and oils (added lipids), meat and dairy.

In addition to differences in food consumption, it is highly recommended to include differences in meal frequency and energy yielding nutrients.

Disparities can optionally be reported based on region, ethnic group, urban/rural area, religion, income and employment status. Disparities in food-related values, attitudes and beliefs or additional food items or groups (fish, alcoholic beverages and food supplements) may be included.

The development of a definition was important because for a comparison to be meaningful the measurements need to be sufficiently similar. Earlier studies have indicated that socio-economic differences are more evident on the food level than on the nutrient level (Hulshof et al. 1991, Prättälä 1995, Roos et al. 1996). Therefore, in this study the focus was on food consumption, but meal patterns, meal frequency and nutrient intake were also included as highly recommended variables. Because there are so many food items, and comparing food groups is challenging, it was decided to focus on the main health-related food groups: fruits, vegetables, fats and oils (added lipids), meat and dairy. These indicator foods were chosen because they play an important role in public health and the researchers found comparison of these possible. The food groupings and their descriptions (Appendix 6) are largely based on the food grouping system used in DAFNE (Trichopoulou and Lagiou 1997, 1998).

Because lifestyle characteristics and food consumption patterns differ for children, adolescents, adults, and the elderly, a decision was made to focus on adults (18-65 years). The chosen age group includes those who are active in the labour market and therefore their educational level has an effect on their lifestyle. Since men and women have different food habits, and the social patterning of food habits also varies by gender, it was relevant to examine disparities in food habits in both gender groups separately.

2.1.4. Measurement of socioeconomic status

Socioeconomic status describes a person's relative position in the social stratification of a society. Socioeconomic status has been assessed with a wide variety of indicators, most frequently income or education and less often occupation or other measures. Some studies have used composite indices, e.g. on the basis of education and occupation. In comparative studies caution is necessary because of historical and cultural differences and measurement variation. In a Finnish study of inequality in nutrition, education was a more important determinant than income and occupation (Roos 1998).

Education was mainly used as a measure of socioeconomic status in the current study, but occupation was used when information on education was missing. Income was only used when

there was no information on education or occupation. It was avoided because it is difficult to get reliable information on it, and several aspects such as size of household, spouse's earnings and income transfers influence the available income.

Educational level

Education as a measure of socioeconomic status has a number of advantages compared with occupation or income. First, each male and female respondent can be classified according to his or her own education rather than the spouse's. Second, education in contrast to occupation and income usually undergoes only minor changes during adult life. Third, education forms an ordinal scale. Its limitation as a measure is its skewed distribution in the population (Lahelma et al. 1997b). The level of education has increased in Europe since World War II and younger people are better educated than the older age groups (Lahelma and Karisto 1993).

In a recent comparative study of socioeconomic inequalities in health in Europe by Kunst et al. (1996) educational levels were grouped according to a standard 5-level classification developed by the OECD (no education, primary education, lower secondary education, upper secondary education, and post-secondary education). Other health-related studies have often used three educational level groups: low/intermediate/high or basic/secondary/higher (Hulshof et al. 1991, Valkonen et al. 1997, Roos 1998). In the DAFNE project, five comparable between countries levels were used for analysis: illiterate/elementary not completed, elementary completed, secondary education not completed, secondary completed and college/university (Trichopoulou and Lagiou 1997, 1998).

Occupational class

Occupation is a comprehensive socioeconomic indicator but it is difficult to measure. For example, it may be difficult to classify persons with several different jobs according to their place in the social hierarchy. Occupational class is only suitable for those who are economically active and have an occupation. The economically inactive groups include students, the unemployed, housewives and pensioners. There is a problem in studies that compare women and men because occupational class better describes the socioeconomic status of men than women (Arber and Lahelma 1993, Arber 1997). Women are less likely to have paid work and they have more often been classified according to their partner's occupation than their own.

In the recent comparative study by Kunst et al. (1996) occupational levels were grouped according the EGP (Erikson-Goldthorpe-Portocarero) scheme with 10 groups. Other health-related studies have used 3-8 occupation or social class groups (Hulshof et al. 1991, Lahelma et al. 1997b, Liberatos et al. 1988, Trichopoulou and Lagiou 1998).

2.1.5. Criteria for choosing the studies

Criteria for choosing the studies were defined by the Disparities group (for definitions and a more detailed description of the criteria and variables see Appendix 6). Only studies and data

available to the scientific community were included and others, such as commercial marketing surveys, were omitted. For a study or published report to be included it had to fulfil the following basic criteria:

1. The subjects had to be **adults** (18-65 years).
2. The period of a study (data collection) had to be **1985-1997.**

In addition, the following variables were obligatory, highly recommended or optional:

1. Obligatory
- education and/or occupation
- age
- gender
- food groups/items

2. Highly recommended
- energy yielding nutrients
- meal frequency

3. Optional
- region
- ethnic group
- urban/rural area
- religion
- income
- (un)employment
- food-related values, attitudes, beliefs
- fish
- alcoholic beverages
- food supplements

2.2. Methods for analysing the studies

When the relevant studies had been identified the next step was to evaluate critically the nature, scope and comparability of the data sources. The studies were analysed systematically by qualitative review and meta-analysis. Each study was taken at face value and common conclusions were identified. Because the relevant studies were heterogeneous, used various methods and did not all provide gender-specific results at the time of analysis nor quantitative data on nutrient intake, a formal meta-analysis was possible for only a small part of the identified studies. Therefore, the integration of findings was mainly done by other types of systematic analysis such as qualitative classifications and tabulations (Petitti 1994).

2.2.1. Qualitative review (Questionnaire II)

Information used for integrating the findings was gathered mainly by a second questionnaire (Appendix 7, Questionnaire II; Appendix 6, Instructions). This questionnaire aimed at collecting information on background, characteristics, methods and results from relevant studies. Members of the steering committee participated in developing the questionnaire. Questionnaire forms were pre-filled with the available information for the studies that had been identified by the literature searches and the first questionnaire. They were then mailed for completion to the researchers who had responded to the earlier questionnaire (see 2.1.2.) and had reported relevant studies.

The information from the questionnaires was condensed and presented as tables (Appendices 9 and 10) and maps (Figures 2-9), the formats of which were discussed at two workshops. The relationship between socioeconomic status (estimated through education or occupation) and the consumption of each food item was defined as strongly positive, positive, strongly negative, negative or no association. The studies falling into each category were counted and conclusions were drawn.

Ranking of studies

The ranking of the studies was suggested at a workshop. The ranking system was developed to get a rough measurement of the suitability of the various studies included in the analysis. The final ranking system was based on the representativeness of the sample, response rate, socioeconomic status variable, unit of study, food groups, age groups and information on statistical estimates needed for conducting a formal meta-analysis (Appendix 8).

The studies received ranking points from 1-10 (possible range 0-12) (Appendix 8). Low points indicated that a study fulfilled the predefined criteria better. Two studies got 1 point, 28 studies got 2-3 points, 6 studies 4-5 points, 9 studies 6-7 points, and 1 study 10 points. The points varied for different kinds of studies. Individual nutrition surveys and other studies which reported food consumption in g/day or g/10 MJ got points from 2 to 7. Household budget surveys tended to get higher points (5-7), mainly because age and gender specific estimates of food availability were not available at the time of analysis. Health and lifestyle surveys reporting food frequencies got points from 1 to 10.

The main outcome of the ranking was that the study (number 46), which got clearly higher points than the other studies (10 points), was left out.

Tables

The tables of results of the systematic qualitative analysis (Appendix 10) include the study number, as well as information on the consumption in low education and high education groups, and on the difference in consumption by education. The majority of the studies included information on education, but one study from the Netherlands (37), one study from Spain (42), and two studies from the United Kingdom (48, 49) only reported consumption by occupation, social class or income. Therefore the latter information has been used for these studies.

In the tables the difference in the use of indicator foods and energy-yielding nutrients by education (occupation or income) has been coded based on the following criteria:

♦♦♦ = statistically significant difference and systematic trend
♦♦ = systematic trend
♦ = statistically significant difference between low and high education
NS = not tested or no trend
— = no data available, missing data

For the difference to be statistically significant the study must have reported p values of <0.05, <0.01 or <0.001. Systematic trend has been used to describe results that successively increase or decrease from low to high education (occupation or income). It did not entail a trend test. If results were reported for more than three educational groups, the result of one of the groups was allowed to differ.

Maps

Maps have been used to present the association between food consumption and education (occupation or income) in the different studies (Figures 2-9). The association is reported as strong positive, positive, no association, negative, and strong negative association. Positive association means that consumption is higher with higher education, whereas negative association means that consumption is lower with higher education. The strength of the association is based on the type of difference (Table 5). A strong association requires the difference to be statistically significant with a systematic trend (♦♦♦) for both men and women. The number of studies varies in the maps because not all studies incorporated data on all food groups. The symbols in the maps include the study numbers.

Table 5. The correspondence between the difference in food habits by education (occupation or income) reported in the tables and the association presented in the maps.

		Men				
		♦♦♦	♦♦	♦	NS	—
Women	♦♦♦	⬆ or ⬇	⇧ or ⇩	⇧ or ⇩	⇧ or ⇩	
	♦♦	⇧ or ⇩	⇧ or ⇩	⇧ or ⇩	⇧ or ⇩	
	♦	⇧ or ⇩	⇧ or ⇩	⇧ or ⇩	⇧ or ⇩	
	NS	⇧ or ⇩	⇧ or ⇩	⇧ or ⇩	○	
	—	[1]				

Difference in table (for men and women):

♦♦♦	statistically significant difference and systematic trend
♦♦	systematic trend
♦	statistically significant difference between low and high education
NS	not tested or no trend
—	no data available, missing data

Association presented in map:

⬆ or ⬇	Strong positive or negative association
⇧ or ⇩	Positive or negative association
○	No association
[1]	No symbol in map

2.2.2. Meta-analysis

Meta-analysis is a statistical method used for quantitative systematic analysis of results from several individual studies for the purpose of integrating their findings (Greenland 1998). This study used an analytic approach in which the purpose was to assess systematic variations and explore sources of variation.

The elements needed for meta-analysis are exposure, outcome, effect, confounders and effect modifiers. In this study exposure was socioeconomic status (education or occupation), outcome was food consumption, effect was the difference in food consumption between high and low education (g/person/day), possible confounders were age and energy intake, and effect modifiers country, gender and method of dietary assessment.

The first step in meta-analysis is the selection of studies and accumulation of descriptive statistics across studies. A table for collecting information for the meta-analysis was developed at the second workshop (Appendix 11). Tables were pre-filled for 11 studies from 8 different countries based on the information retrieved from the qualitative review. Although the methodology varied in the studies, they all included information on consumption of certain foods by education or occupation. It was therefore considered appropriate to group these studies for meta-analysis. The pre-filled tables were mailed to the researchers responsible for the studies with a request for filling in the missing data.

For each food group within the studies the absolute differences in the mean consumption (in g/person/day) between low and high education or occupation groups were computed. Separate meta-analyses were performed for each food group and nutrient, and more detailed results will be published later.

3. IDENTIFIED STUDIES

3.1. Studies included in qualitative review

Based on the first questionnaire to researchers (Appendix 4) 47 studies from 16 countries were identified to fulfil the criteria (adults, study year 1985-97) and to include the obligatory variables (education or occupation, age, gender, food groups/items). The studies were mainly large-scale national dietary, health behaviour and household budget surveys. As already mentioned, only data available to the scientific community were included and commercial marketing surveys were left out.

As a next step, detailed instructions as to which studies to include were specified and the second questionnaire (Appendix 7), which aimed at collecting information on the relevant studies, was mailed to researchers. The researchers returned forms for 50 studies from 15 different countries. Some of the studies identified earlier were not included in these because results were not available or researchers did not respond. Because three studies did not fulfil all criteria, the number of studies further decreased to 47, characteristics of which are described in more detail in Appendix 8. The deadline for inclusion of studies was September 1998. Studies suggested after this date could not be included for practical reasons.

The dietary methods used in the studies varied: common methods were food frequencies, food records and household acquisitions (Table 6).

Table 6. Dietary methods used in the studies.

Method	Study numbers	Countries
Questionnaire (interview, telephone)	9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 33, 34, 35, 36, 47	Denmark, Estonia, Finland, Lithuania, Netherlands, Switzerland
Food frequency	30, 39, 41, 42	Germany, Norway, Spain
Dietary (food) record	8, 28, 30, 31, 37, 38, 45, 46, 48	Denmark, Finland, Germany, Netherlands, Sweden, UK
Diet history	7, 43, 44	Denmark, Spain
24-hour recall	41, 42	Spain
Household acquisitions[1)]	1, 2, 3, 4, 5, 6, 40, 45, 49	Belgium, Greece, Hungary, Poland, Spain, Sweden, UK

[1)] Studies 1, 2, 3, 4, 5, and 6 are published in DAFNE I and II reports (Trichopoulou et al. 1996, Trichopoulou and Lagiou 1997, 1998).

The main socioeconomic variable was education. Apart from three studies, all the others included education, and many had also measured occupation (Table 7)[1].

Table 7. Socioeconomic status (SES) variables included in the studies.

SES-variables	Study numbers	Countries
Only education	1, 2, 3, 4, 5, 6, 28, 31, 35, 36, 47	Belgium, Finland, Germany, Greece, Hungary, Lithuania, Netherlands, Poland, Spain, Switzerland
Education and occupation	7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 33, 34, 37, 38, 39, 40, 43, 44, 45, 46	Denmark, Estonia, Finland, Germany, Lithuania, Netherlands, Norway, Poland, Spain, Sweden
Education and socioeconomic status	41	Spain
Only social class	42, 48	Spain, UK
Only income level	49	UK

The number of studies for which results have been presented is smaller (n = 33) (Table 8). One study based on the ranking criteria was left out (see p. 29) and for some of the studies, which have been repeated annually or biannually, the results were combined. If results have been combined it has been indicated with a * after the study number. Similarly to Table 8, in the tables of results (Appendix 10) the studies have been grouped into three groups based on their types of methods and data. The largest group included 13 dietary surveys (group A), which reported consumption as g/day or g/10 MJ. Household budget surveys, which reported availability in g/day, formed a group with 9 studies (group B). The third group consisted of 11 studies, which were mainly based on health behaviour surveys and presented frequencies of consumption (group C).

[1] Results are presented by occupation/social class/socioeconomic status for 3 studies (37, 42, 48) and by income for one study (49). Although study 37 measured education results had been published by socioeconomic status.

Table 8. Studies (n =33) included in the analysis divided into groups according to method and type of information (within each group the studies are listed from the North to the South).

A. Dietary surveys (g/day or g/10MJ) (n = 13)				
No.	**Country**	**Year**	**Study name**	**Reference[1)]**
39	Norway	1993-94	NORKOST	National Nutrition Council 1997
28	Finland	1992	Dietary Survey of Finnish Adults	Kleemola et al. 1996, Roos et al. 1996
45	Sweden	1989	Swedish National Dietary Survey (HULK)	Becker 1994
7	Denmark	1985	Dietary Habits in Denmark	Haraldsdottir et al. 1987
8	Denmark	1995	Dietary Habits in Denmark	Unpublished data
48	UK	1986-87	National Diet and Nutrition Survey (NDNS)	Gregory et al. 1990
30	Germany	1985-89	German National Food Intake Survey	Unpublished data
31	Germany	1984-85	MONICA Augsburg	Kussmaul et al. 1995
37	Netherlands	1987-88	Dutch Nutrition Surveillance System	Hulshof et al. 1991
38	Netherlands	1992	Dutch Nutrition Surveillance System	Unpublished data
41	Spain	1990	Food Habits in Basque Country	Unpublished data
42	Spain	1992-93	Assessment of Nutritional Status of Catalonia's Population	Unpublished data
43	Spain	1989-90	Food Habits in Navarra's Population	Unpublished data
B. Household budget surveys (g/day) (n = 9)				
No.	**Country**	**Year**	**Study name**	**Reference**
49*	UK	1985-89	National Food Survey	Ministry of Agriculture, Fisheries and Foods 1986;1987;1988;1989
1	Belgium	1987-88	DAFNE I	Trichopoulou and Lagiou 1997
4	Poland	1988	DAFNE I	Trichopoulou and Lagiou 1997
40	Poland	1996	Polish Household Budget Survey	Unpublished data
3	Hungary	1991	DAFNE I	Trichopoulou and Lagiou 1997
6	Spain	1990-91	DAFNE II[2)]	Trichopoulou and Lagiou 1998
44	Spain	1990-91	Spanish Household Budget Survey[2)]	Unpublished data
2	Greece	1987-88	DAFNE I	Trichopoulou and Lagiou 1997
5	Greece	1993-94	DAFNE II	Trichopoulou and Lagiou 1998
C. Health behaviour surveys (frequency) (n = 11)				
No.	**Country**	**Year**	**Study name**	**Reference**
16*	Finland	1986-89	Health Behaviour among Finnish Adult Pop.	Piha et al. 1986a,b; Niemensivu et al. 1988a,b; Berg et al. 1990a
20*	Finland	1990-93	Health Behaviour among Finnish Adult Pop.	Berg et al. 1990b;1991;1993a,b
24*	Finland	1994-97	Health Behaviour among Finnish Adult Pop.	Helakorpi et al. 1994;1995;1996;1997
9	Denmark	1986	DAN-MONICA II 1986	Osler et al. 1997
10	Denmark	1993	DAN-MONICA II 1993	Osler and Schroll 1995
36	Netherlands	1989	Dutch Health Interview Survey 1989	de Bruin 1991
47	Switzerland	1992-93	Ernährung in der Schweiz	Eichholzer et al. 1995
11*	Estonia	1990, 92	Health Behaviour among Estonian Adult Pop.	Lipand et al. 1992;1993
13*	Estonia	1994, 96	Health Behaviour among Estonian Adult Pop.	Lipand et al. 1995; Kasmel et al. 1997
33*	Lithuania	1994, 96	Health Behaviour among Lithuanian Adult Pop.	Grabauskas et al. 1997;1998
35	Lithuania	1993	CINDI Programme Screening 1993	Unpublished data

* Results from two or more years combined.

[1)] For studies marked as unpublished data and for further references concerning the other studies, see Appendix 9.

[2)] It should be noted that studies 6 and 44 are based on the same data. Any discrepancy observed in the presented results may be explained by the different food classification schemes used in the two approaches.

3.2. Studies included in meta-analysis

The number of studies that were included in the meta-analysis was limited (Table 9). Only studies belonging to Group A, "Dietary surveys", included the information necessary for the meta-analysis, i.e. data on consumption in g/person/day for men and women. Household budget surveys (Group B) were not considered since they did not have estimates of availability by education and/or occupation for men and women. Health behaviour surveys (Group C) did not provide information on consumption in g/person/day.

Eight of the studies included in the qualitative analysis were eligible for meta-analysis. Table 9 includes nine studies because the German study has two parts that have been counted as two separate studies. The number of studies included in each meta-analysis (separate meta-analyses were performed for different food groups and nutrients) varied from 3 to 9 depending on the available information.

Similarly to the studies included in the qualitative analysis, there is also variation among the studies included in the meta-analysis. They have used diverse dietary methods and the age groups included vary. A few of the studies have been based on data collected in the late 1980s and the rest in the 1990s. The studies included do not represent all European regions because no studies in the East qualified. The North and Spain in the South are best represented.

Table 9. Characteristics of studies (n = 8) included in the meta-analysis.

Study No.	Country	Year	Dietary method	Age groups, years	Response rate, %
39	Norway	1993-1994	Food frequency	16-79	63
28	Finland	1992	3 day non-weighted dietary record	25-64	66
45	Sweden	1989	7 day non-weighted dietary record	19-74	70
8	Denmark	1995	estimated 7 day food record	15-80	58
30	Germany-VERA	1985-1989	7 day non-weighted dietary record	18-65	74
30	Germany-NVS	1989-1989	7 day non-weighted dietary record	18-65	74
37	Netherlands	1987-1988	2 day non-weighted dietary record	19-85	81
41	Spain,Basque	1990	3-24 hours recall	25-60	73
43	Spain, Navarra	1989-1990	diet history	15-59	95

4. SOCIOECONOMIC DIFFERENCES IN FOOD HABITS

The results section begins with presenting consumption of indicator foods (fruits, vegetables, dairy, meat, fats and oils) and energy-yielding nutrients based on the qualitative analysis. Next, the outcome of the meta-analysis is presented with slightly different groupings. The section ends with the results on socioeconomic differences in meal patterns based on the qualitative analysis.

4.1. Indicator foods

4.1.1. Fruits

Consumption of fruits by education[1] was reported in all 33 studies (Appendix 10).

Figure 2 presents the association between education and consumption of fruits. The majority of studies showed positive (n = 23) or no association (n = 8) between high education and fruit consumption; those with higher education either consumed more or the same as those with lower education. A strong positive association indicating statistically significant differences and a systematic trend was found in 9 studies, predominantly in the North and the West. Only two Spanish studies showed a negative association.

4.1.2. Vegetables

Consumption of vegetables[1] by education was reported in all 33 studies (Appendix 10).

Figure 3 presents the results for consumption of vegetables by education. The pattern for vegetables is fairly similar to fruits. The association between high education and consumption of vegetables is mainly positive (n = 20), especially in the North and the West. In the South, studies indicate a more negative association (n = 6). Studies in Greece and Spain show that those with higher education consume less vegetables than those with lower education.

4.1.3. Dairy produce

Consumption of milk, cheese and other dairy products by education[1] was reported in 31 studies (Appendix 10). However, figure 4 for milk and figure 5 for cheese are based on 24 and 21 studies, respectively, because some studies only reported total dairy or other types of groupings.

[1] Three studies have results presented by occupation (37, 42, 48) and one by income (49).

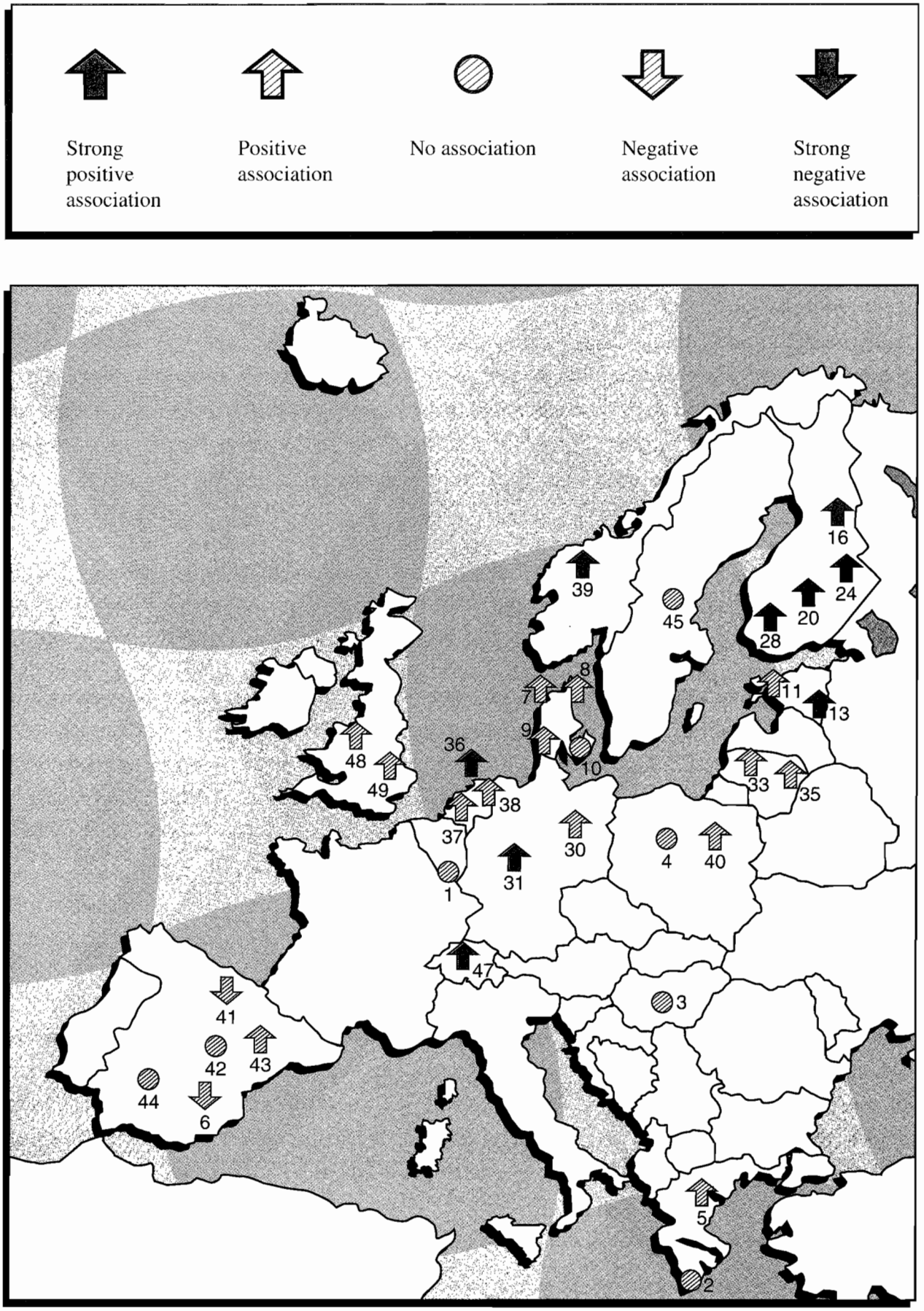

Figure 2. Association between FRUIT consumption and high education in 33 European studies.

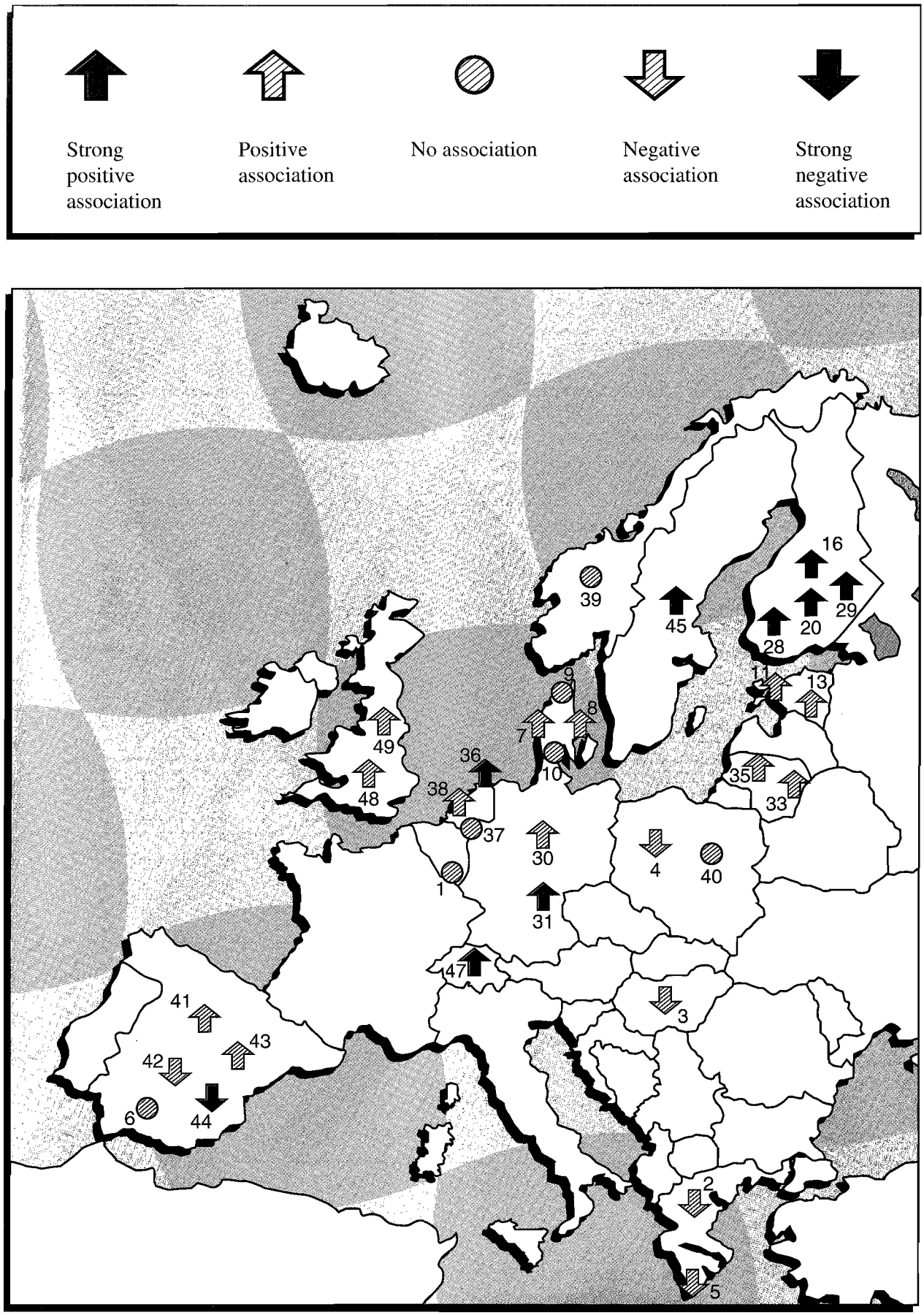

Figure 3. Association between VEGETABLE consumption and high education in 33 European studies.

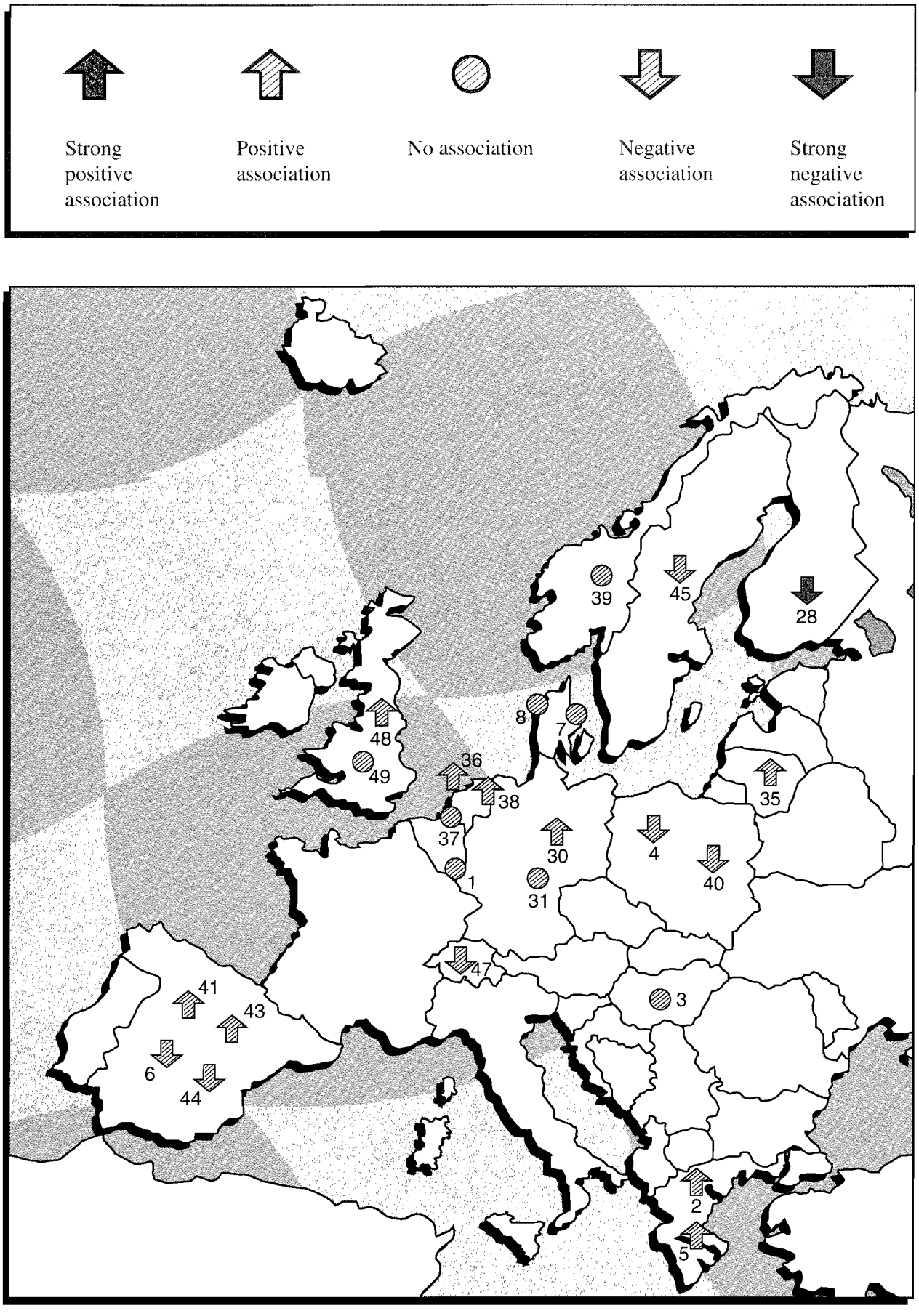

Figure 4. Association between MILK consumption and high education in 24 European studies.

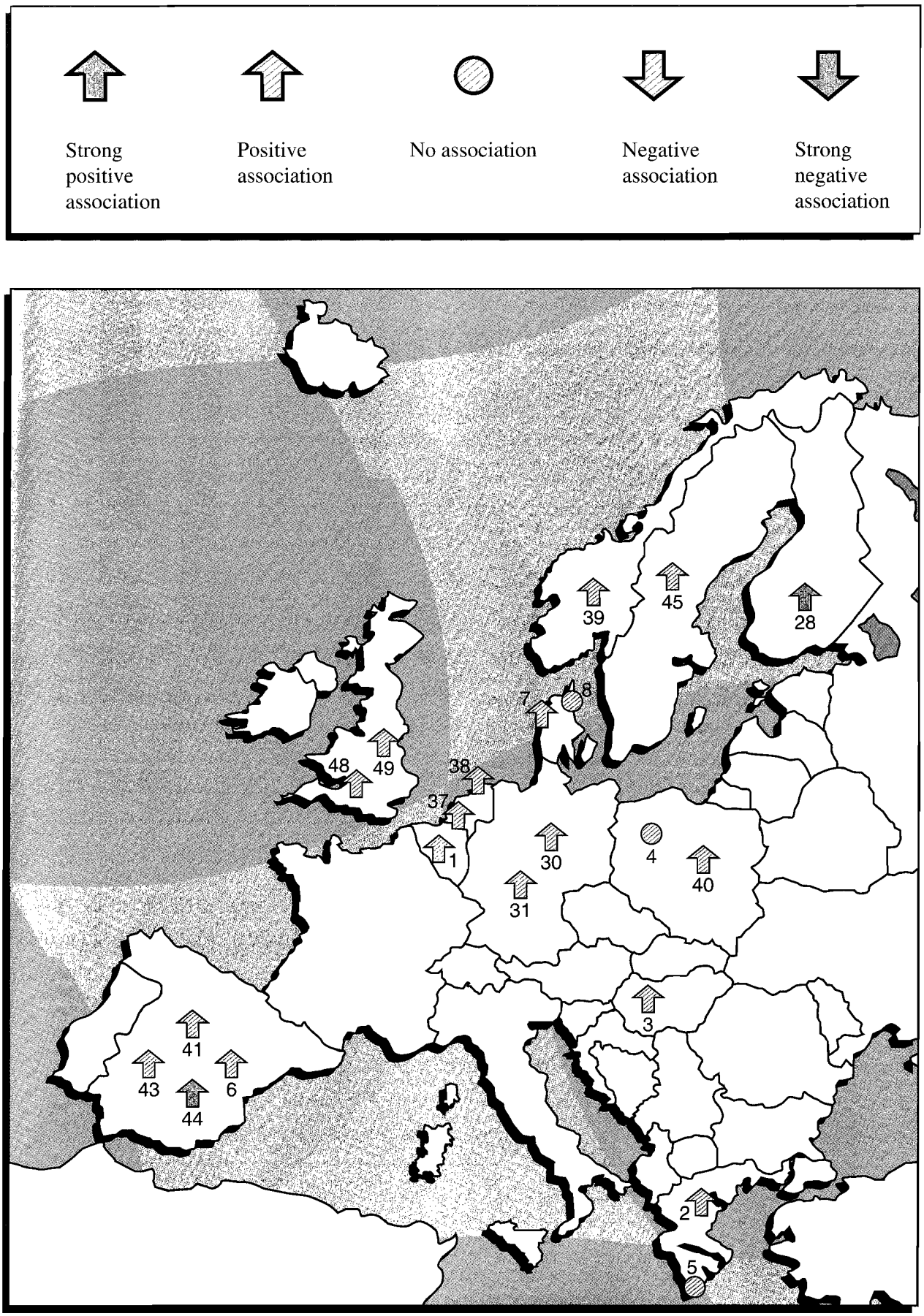

Figure 5. Association between CHEESE consumption and high education in 21 European studies.

Figure 4 indicates that milk consumption showed no single systematic pattern. It appears that in the North those with higher education consume less milk than those with lower education.

Figure 5 presents the association between high education and cheese consumption. With the exception of three studies, which showed no association, the rest indicated positive association, i.e. those with higher education consume more cheese.

4.1.4. Meat

Consumption of meat and meat products by education[1] was reported in 23 studies (Appendix 10).

Figure 6 presents the association between high education and consumption of meat and meat products. There is a tendency that those with higher education consume less meat and meat products (n = 14). Only one study in the United Kingdom showed a positive association.

4.1.5. Fats and oils (added lipids)

Total fat, butter/animal fat and/or margarine/vegetable fat/vegetable oil by education[1] were reported in 31 studies (Appendix 10). Since the classification of fats and oils (added lipids) varied in the studies, the results are presented according to three categories: 1) total fats or fats and oils, 2) butter or animal fat, and 3) margarine, vegetable oil or vegetable fat.

Results from the 18 studies that reported consumption of total fat or fats and oils by education are summarised in Figure 7. There is a tendency that those with higher education consume less fat (n=13).

Figure 8 presents the association between high education and butter or animal fat in 23 studies. There is no single systematic pattern but it seems that in the North those with higher education consume less butter or animal fat. In the West it is the opposite, i.e. those with high education consume more butter or animal fat. In the South only Spain follows the latter tendency.

The results for margarine, vegetable oil or vegetable fat based on 19 studies (Figure 9) show an almost opposite picture from those for butter or animal fat. Studies in the South and the West indicate a tendency that those with high education consume less vegetable fat.

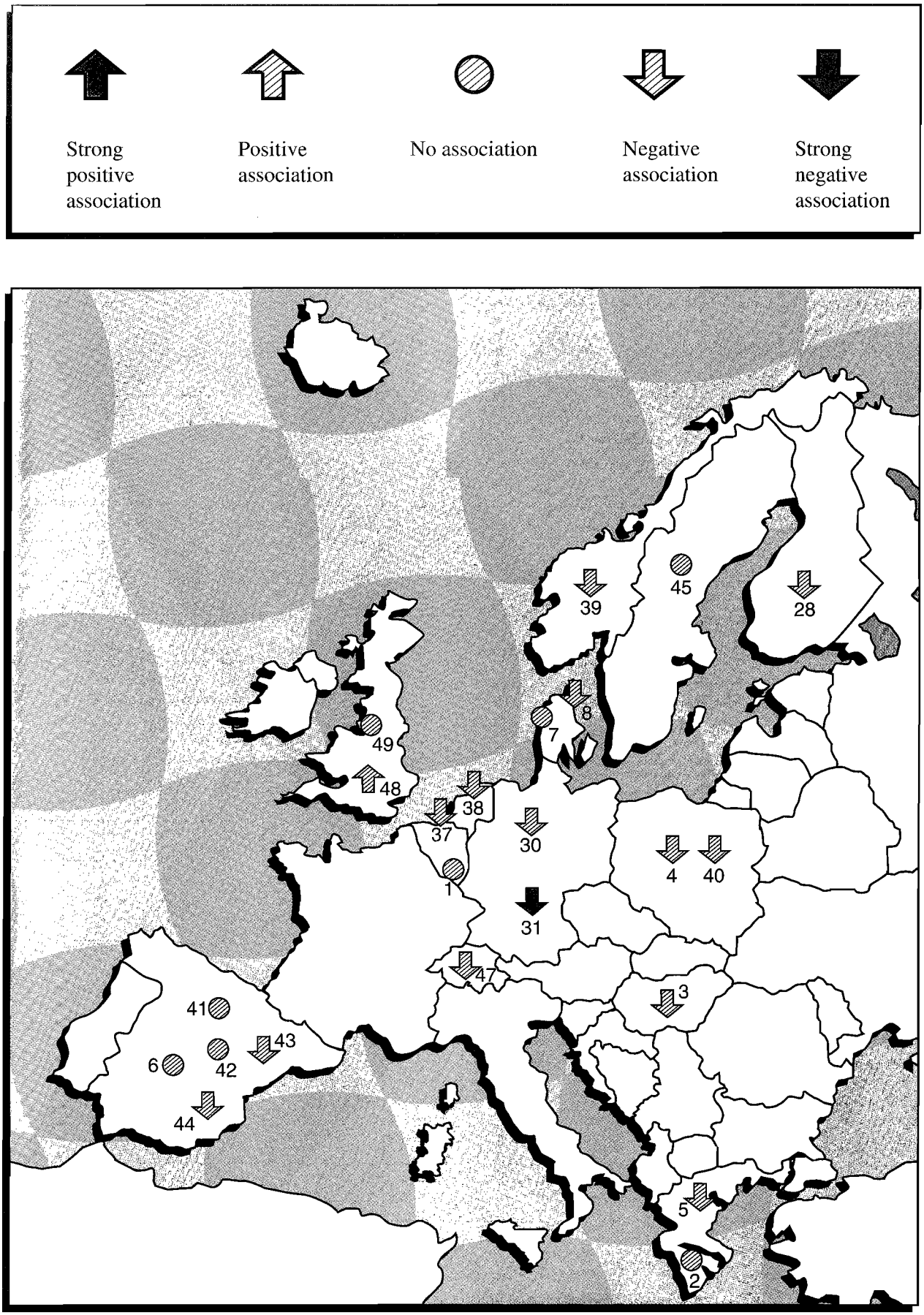

Figure 6. Association between MEAT consumption and high education in 23 European studies.

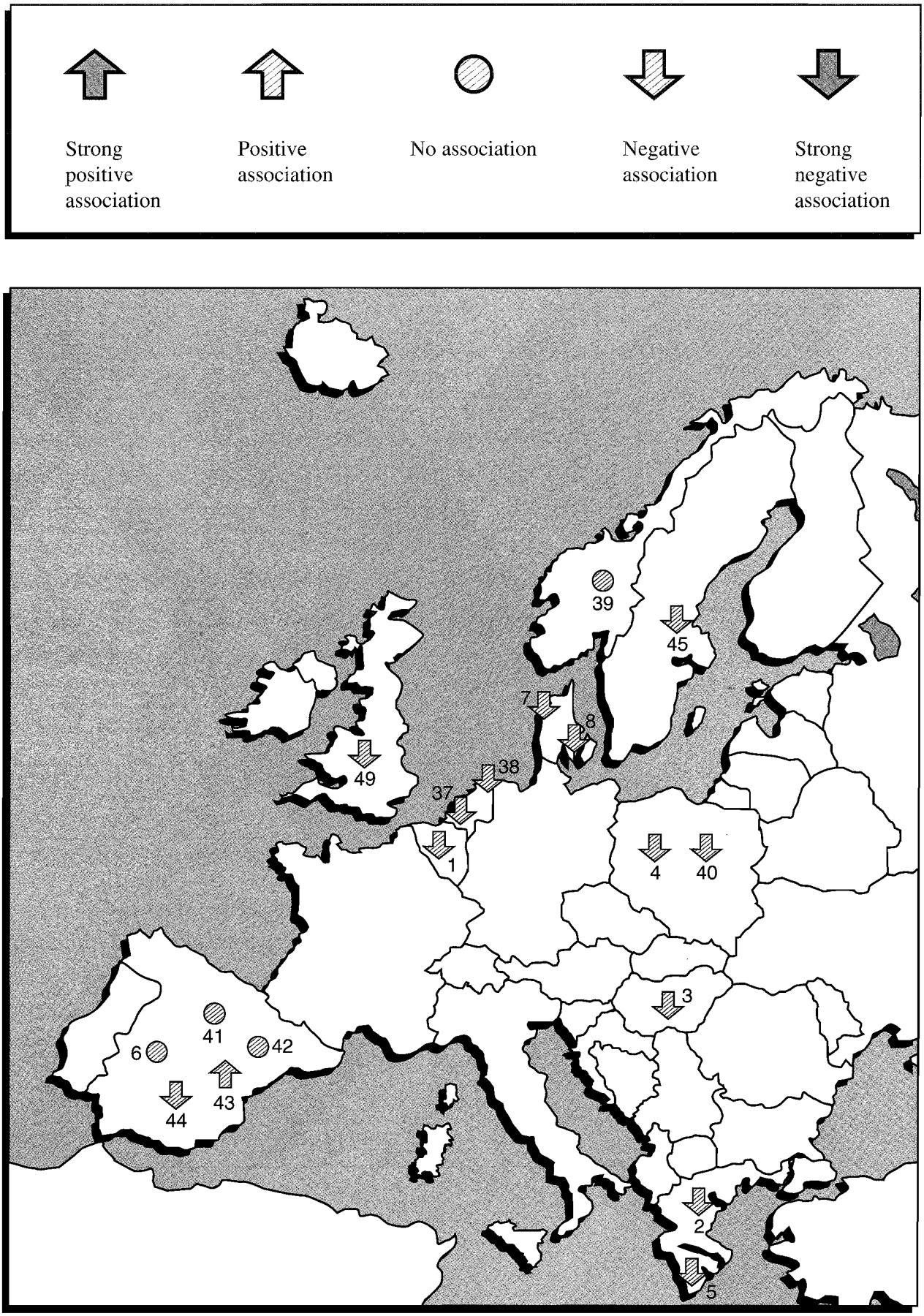

Figure 7. Association between the consumption of TOTAL FAT, FATS and OILS and high education in 18 European studies.

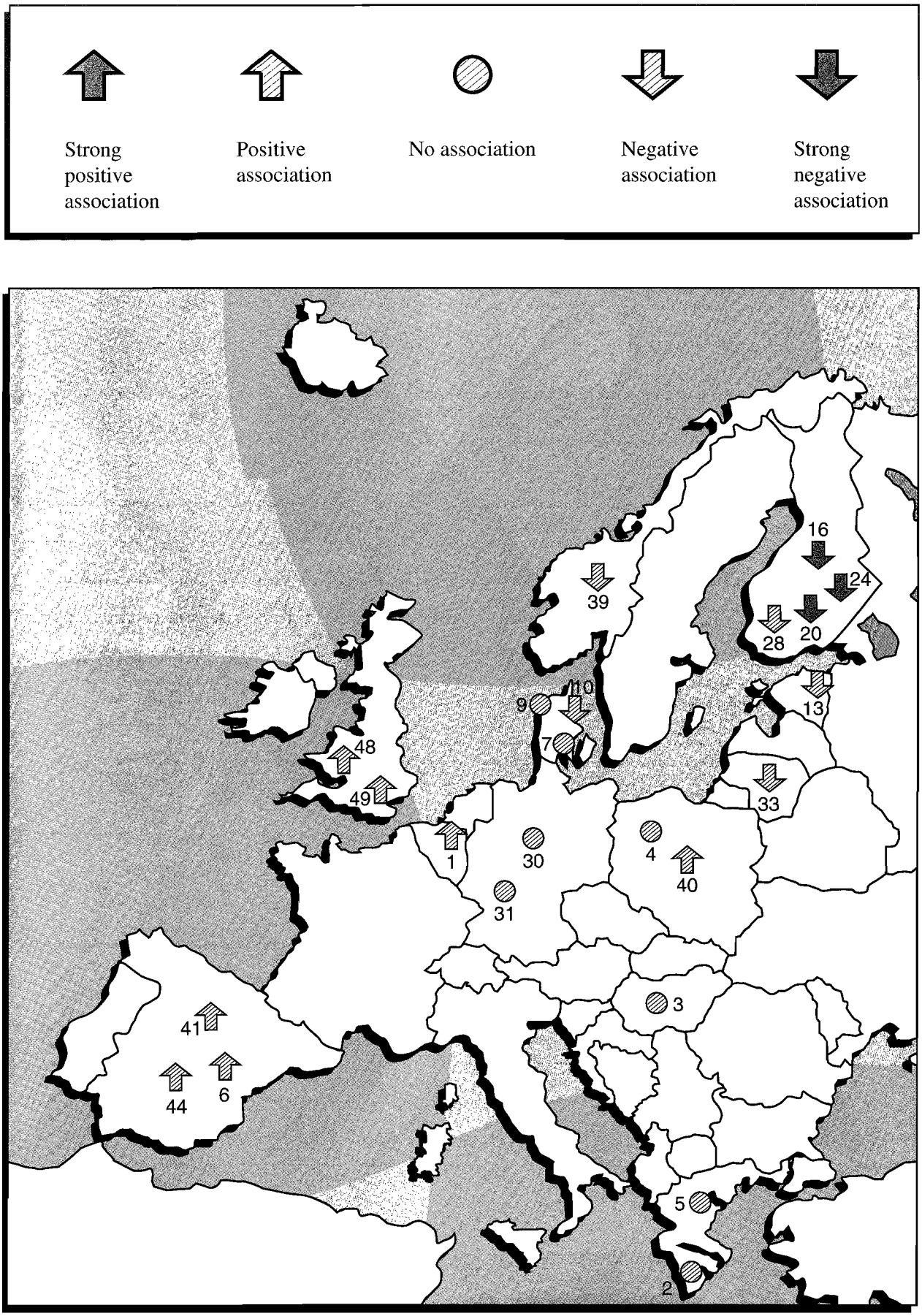

Figure 8. Association between the consumption of BUTTER, ANIMAL FAT and high education in 23 European studies.

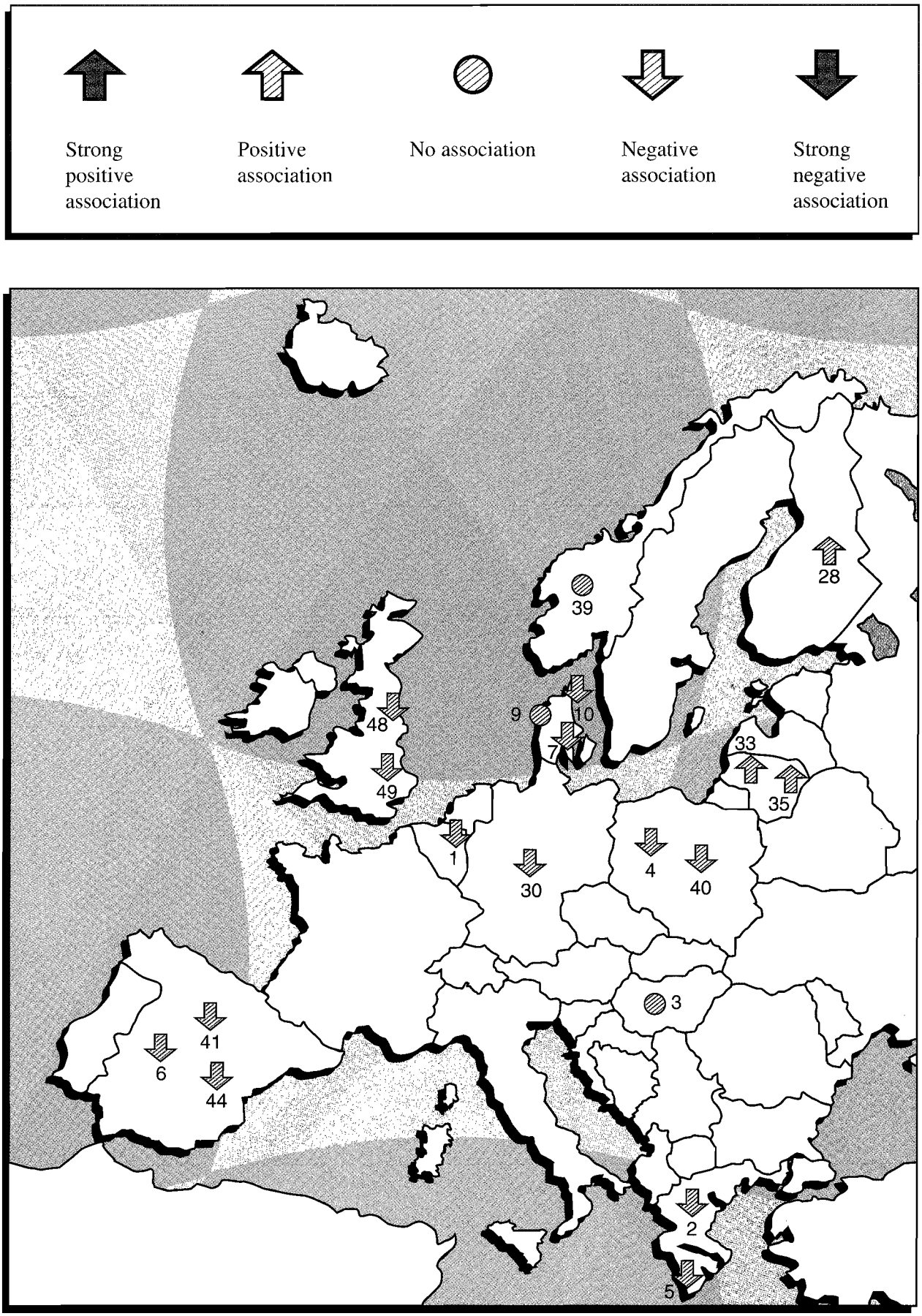

Figure 9. Association between the consumption of MARGARINE, VEGETABLE OILS or VEGETABLE FATS and high education in 19 European studies.

4.2. Intake of energy-yielding nutrients

Results on consumption of energy-yielding nutrients by education[1] are presented for 15 studies (Appendix 10). There were no results for food frequency studies nor for most of the household budget surveys.

The differences between the high and low education groups' intakes of energy-yielding nutrients were in general small. Disparities were found in some studies in intakes of fat, saturated fat, carbohydrates, sugar, protein and alcohol.

For fat most studies reported no significant association between high education and fat intake. There is a tendency that those with high education have a smaller fat intake (Table 10).

Table 10. The proportion (%) of fat of total energy in men and women with low and high education.

Study No.	Country	Men		Women	
		Low educ	High educ	Low educ	High educ
39	Norway	31 E%	30 E%	30 E%	29 E%
28	Finland	35	34	34	34
45	Sweden	37	35	35	36
7	Denmark	44	43	43	41
8	Denmark	41	37	38	37
48	United Kingdom	37	38	39	39
30	Germany	39	38	41	38
31	Germany	42	42	-	-
37	Netherlands	41	40	42	40
38	Netherlands	38	37	39	36
41	Spain, Basque	31	34	37	39
42	Spain, Navarra	40	42	43	42

4.3. Results of meta-analysis

The results of the meta-analysis (Table 11) are in general in accordance with the results of the qualitative analysis. Those with higher education consume more fruits, vegetables and dairy products than those with lower education, but less meat. Within the dairy produce group those with higher education consume more cheese and skimmed milk but less full-fat milk than those with lower education.

Men with high education have a smaller energy intake than those with lower education whereas for women the pattern is the opposite (Table 12). There is a tendency for those with high

[1] Three studies have results presented by occupation (37, 42, 48) and one by income (49).

education to have a lower (energy adjusted) intake of fat and higher intake of alcohol than those with low education.

Table 11. The average difference (95% confidence intervals) in consumption of each food item (g/person/day) between the highest and the lowest educational/occupational level.

	EDUCATION (highest minus lowest level)			SES (occupation)[1] (highest minus lowest level)		
(g/person/day)	Included surveys (n)	Men	Women	Included surveys (n)	Men	Women
Fruits	9	+24.0 (+19.0 to +29.0)*	+26,7 (+21.7 to +31.8)*	7	+20.4 (+15.6 to +25.2)*	+10.9 (+5.8 to +16.1)*
Vegetables	9	+12.1 (+8.3 to +15.8)*	+17.5 (+13.7 to + 21.2)*	7	+10.3 (+6.8 to +13.9)*	+9.3 (+5.4 to + 13.1)*
Fats and oils (added)	9	-2.9 (-4.0 to -1.9)*	-3.1 (-3.9 to- 2.3)*	7	-3.5 (-4.5 to -2.4)*	-2.7 (-3.6 to -1.8)*
Butter	6	+0.3 (-0.5 to +1.0)	-0.2 (-0.8 to +0.4)	5	-0.1 (-0.7 to +0.5)	-0.3 (-0.6 to +0.02)
Margarine	6	-3.1 (-3.8 to –2.3)*	-2.3 (-2.8 to -1.7)*	5	-2.7 (-3.3 to -2.0)*	-2.5 (-3.0 to –2.0)*
Vegetable oils	5	+0.4 (+0.3 to +0.5)*	+0.1 (+0.02 to +0.2)*	4	+0.2 (+0.1 to +0.3)*	0.0 (-0.1 to +0.1)
Meat	9	-32.6 (-36.0 to –29.1)*	-24.3 (-26.9 to –21.8)*	7	-24.8 (-28.2 to –21.4)*	-12.8 (-15.4 to –10.1)*
Dairy	8	+62.3 (+52.8 to +71.9)*	+54.3 (+47.0 to +61.6*	7	+6.8 (-0.1 to +13.7)	+20.3 (+15.5 to +25.1)*
Cheese	9	+9.9 (+8.4 to +11.4)*	+10.6 (+9.3 to +11.8)*	7	+5.1 (+3.7 to +6.5)*	+5.4 (+4.1 to +6.7)*
Milk total	9	+46.9 (+38.0 to +55.9)*	+39.9 (+33.2 to +46.6)*	7	+12.2 (+3.6 to +20.7)*	+13.4 (+6.3 to +20.4)*
Full-fat milk	4	-25.1 (-41.0 to –9.3)*	-20.5 (-28.5 to –12.6)*	3	-16.3 (-28.5 to –4.1)*	-11.2 (-18.9 to –3.6)*
Skimmed milk	4	+24.0 (+6.8 to +41.2)*	+31.6 (+18.4 to + 44.8)*	3	+32.4 (+14.7 to +50.2)*	+41.7 (+26.8 to +56.7)*
Sugar	8	-1.1 (-1.8 to –0.44)*	-0.2 (-0.7 to +0.3)	7	-1.4 (-2.0 to –0.8)*	-1.1 (-1.6 to –0.5)*

[1] SES: socioeconomic status (occupation)

* $p<0.05$

Table 12. The average difference (95% confidence intervals) in nutrient intake (% of total energy intake) between the highest and the lowest educational/occupational level.

	EDUCATION (highest minus lowest level)			SES (occupation) [1] (highest minus lowest level)		
	Included surveys (n)	Men	Women	Included surveys (n)	Men	Women
Total energy intake (kilocal)	8	-34.6 (-55.0 to –14.1)	+82.2 (+65.7 to +98.6)	6	-108.9 (-128.0 to -89.8)*	+9.6 (-6.8 to +26.0)
% of energy intake						
Total fat	9	-1.2 (-1.5 to-0.9)*	-1.5 (-1.8 to -1.2)*	6	-0.9 (-1.2 to -0.6)*	-0.8 (-1.2 to -0.5)*
Saturated fat	8	-0.2 (-0.3 to -0.02)*	-0.6 (-0.7 to -0.4)*	6	-0.3 (-0.4 to -0.2)*	-0.4 (-0.6 to -0.3)*
Monounsaturated fat	7	-0.7 (-0.8 to -0.6)*	-0.7 (-0.9 to -0.6)*	6	-0.4 (-0.6 to -0.3)*	-0.5 (-0.6 to -0.4)*
Carbohydrate	8	+0,7 (+0.4 to +1.0)*	+1.0 (+0.7 to +1.3)*	6	+0.3 (0.0 to +0.6)*	+0.3 (0.0 to + 0.6)*
Protein	8	0.0 (-0.1 to + 0.1)	-0.5 (-0.6 to -0.4)*	6	0,0 (-0.1 to +0.1)	-0.2 (-0.3 to 0.0)
Alcohol	6	+0.6 (+0.5 to +0.7)*	+1.2 (+1.1 to +1.3)*	5	+0.7 (+0.5 to +0.8)*	+0.9 (+0.8 to +1.0)*

[1] SES: socioeconomic status (occupation)
* $p<0.05$

4.4. Meals

Published data on socioeconomic differences in meal patterns is restricted to a few studies in Finland, Estonia, Lithuania, Germany, and the Netherlands (Appendix 10). These studies used different simple methods for measuring various aspects of meals. The adult health behaviour monitoring surveys in Finland, Estonia and Lithuania (Finbalt Health Monitor) included questions about eating breakfast and hot meals. However, there was no specification for time, content, etc. of these eating events. In the German study the questionnaire contained a list of six given "standard meal times" for working days and weekends, and respondents were asked to report whether they eat such meals regularly or not. One Dutch survey included the question "How many hot meals do you have per week?" and another Dutch survey asked how often people skipped breakfast.

Based on these few studies it is impossible to draw conclusions about differences in meals by education in Europe. In the Finbalt studies there was a minor tendency for highly educated people to eat breakfast more often, and especially women to eat fewer hot meals per day. In Germany the tendency was opposite with highly educated men and women consuming meals less regularly. The Dutch surveys indicate a slightly higher meal frequency in the higher educated groups.

5. DISCUSSION

5.1. Main findings

This is the first systematic review of socioeconomic differences in food habits in Europe. There have been other large comparative studies, for example, the EPIC project (Riboli and Kaaks 1997), the Pan EU survey of consumer attitudes to food, nutrition and health (Gibney et al. 1997), and the Network for the Pan-European Food data Bank based on household budget surveys (DAFNE) (Trichopoulou et al. 1996, Trichopoulou and Lagiou 1997, 1998). Although these include information on food consumption in different social groups, they have not specifically addressed socioeconomic differences. A review on socioeconomic health differentials in Europe (Kunst et al. 1996, Cavelaars 1998) included a brief discussion on inequalities in vegetable consumption.

Our study aimed to answer two questions:

1. **Are there research data on socioeconomic differences in food habits and nutrient intake in Europe?**

We have showed that there are data available on socioeconomic differences in food consumption and nutrient intake, but very limited data on differences in meal patterns.

2. **Do those belonging to higher social classes have healthier diets?**
   - Are there socioeconomic differences in the consumption of the main health-related foods and/or nutrients?
   - Are the socioeconomic differences homogeneous across European countries?

Our findings support with some exceptions the assumption that people belonging to higher social classes have healthier diets. Results from the qualitative analysis show that those with high education, with the exception of the South, tend to consume more vegetables and fruits and less fats and oils. However, they also use more cheese, which is against the hypothesis. The results from the meta-analysis showed a similar general pattern. The socioeconomic differences in food consumption are not homogenous across Europe. The patterns vary both by food group and region.

5.2. Evaluation of methods

A project like this, which has to rely on existing data, has to take into account several types of limitations. Cross-national comparisons are not without methodological problems. This section discusses them and how they have been taken into consideration.

There are possible limitations related to the identification of studies for the qualitative review and meta-analysis. Publication bias is a major threat to the validity of the analyses. Studies with positive and significant results are more likely to get published. Because electronic databases may detect only half of all relevant studies due to problems of indexing, it is also important to consult experts when compiling a review in a new field that does not have a clearly defined specialist literature (McManus et al. 1998). Therefore, studies were identified with the help of both literature searches and by consulting experts. In searching Medline and other electronic databases several key words were used to improve the results. Larger studies may include information on food consumption in different socioeconomic groups, but if "food habits" has not been the main topic of the study it may not have been included as a key word.

Snowball sampling was used to identify experts in the field. Participating researchers were in the initial questionnaire asked to name other researchers. This sampling technique may have limited the representativeness of the studies. However, it was the only possible method because there are no registers from which interested researchers could have been sampled.

Because we relied mainly on published data our possibilities to do secondary analysis on primary data were limited. Data suitable for meta-analysis were also restricted. The meta-analysis was based on a small number of studies and, therefore, the results should be treated with caution. Other risks of using meta-analysis include giving more precise results than warranted because a statistical analysis does not convey all the shortcomings of the data. One way to avoid this problem is to include unpublished studies, but they are often difficult to locate. In addition to publication bias, other factors (publication language, database, inclusion criteria) can contribute to biased inclusion of studies in meta-analyses. Sensitivity analysis and funnel points (simple scatterplots of trials' effect estimated against their sample size) are useful to detect bias in meta-analyses (Egger and Smith 1998).

Validity, reliability and representativeness of primary studies are important in secondary analyses. They depend on several factors, such as study design (including sampling method, dietary assessment method and response rate) and how data is analysed. The potential problems with the studies include issues related to representativeness, target group, time, method and reporting.

Since only a limited number of studies were identified, they may not represent the countries. However, most of the studies were large-scale, based on random samples and had acceptable response rates. To limit the problems of target group, age limits were set and only studies focusing on adults were included. However, it is impossible to take all factors into account. For example, because older adults have lower levels of education than younger adults, they may be overrepresented in the lower SES groups. Therefore, studies with a larger proportion of older adults may give different results. As data collection time affects the information, the period of data collection was restricted to 1985-1997. The methods used in the studies varied from questionnaires to dietary recalls and records. Since all methods are subject to different problems and limitations (Willett 1990, Zintzaras et al. 1997) the studies were grouped according to method. Also the various forms of reporting socioeconomic status may cause problems because results vary depending on the variable used and number and size of classes. The definition of disparities in food habits and the criteria for choosing the studies were developed to deal with the problems of various classifications and categories.

All survey methods that rely on self-reported behaviour are subject to problems of reporting error and bias. Misreporting of food intake is a fundamental concern in nutritional research (Macdiarmic and Blundell 1998). Low-energy reporting has been described as a major source of bias in dietary surveys (Gnardellis et al. 1998). Under-reporting has often been associated with lower social classes and lower levels of education, but there is also evidence that it can be linked to those belonging to higher social classes and with high levels of education (Pryer et al. 1995, Hirvonen et al. 1997, Stallone et al. 1997, Macdiarmic and Blundell 1998). Under-reporting by those with lower levels of education has been explained by their poor literacy skills, whereas misreporting of food intake by those with higher levels of education may be connected to the health image of foods and the wish to convey a socially desirable image (Macdiarmic and Blundell 1998). Another related issue is that those who are more health conscious are more willing to take part in dietary surveys. A selective drop out may lead to the underestimation of the real differences in the population. For example, an Australian analysis (Turrell and Najman 1995) has shown that sampling and data collection methods may understate the true range of socioeconomic inequalities in food-related behaviour. Turrell and Najman (1995) pointed out that studies that draw their samples from electoral rolls and collect data using mail-survey questionnaires understate the level of socioeconomic inequality in food-related behaviour. Mail surveys, which require motivation, enthusiasm and literacy, were declared as inappropriate for use with respondents from very low socioeconomic status backgrounds.

Although the studies included in this review fulfilled the criteria for choosing studies, they were still heterogeneous which made direct comparison between them unreliable. This problem was diminished by, instead of comparing absolute differences, analysing the differences within each study and comparing patterns of variation and direction of changes in selected food habits. For

example, the similarities in educational and/or occupational differences in vegetable consumption in various European countries were analysed.

5.3. Socioeconomic status affects the healthiness of the diet

Despite the methodological limitations presented above, some conclusions can be drawn about socioeconomic differences in food habits in European countries. The results of the qualitative analysis show divergent patterns for different foods and also between the regions in Europe. Particularly in the North and the West, people with a higher education level tend to consume more fruits and vegetables, vegetable fat, low fat milk products and cheese than those with a lower education level. The results for vegetables and fruits support the hypothesis that socioeconomic status affects the healthiness of the diet. The results for fats and oils show some support for the presumption as well. The results for meat also show some support for the hypothesis whereas the results for cheese are against it. For nutrients, the association is weak but still in the direction of the hypothesis. Those with higher education in the North and the West tend to have a lower fat intake. For meals the information is too limited to conclude anything.

The results of the meta-analysis are fairly similar to the findings of the qualitative analysis. There are some discrepancies in the results for dairy products, meat, and fats and oils (added lipids). The meta-analysis results indicate more uniform patterns for these foods compared with the qualitative analysis. Because there were more studies from the North in the relatively small meta-analysis, this may explain part of the difference.

If we take into account that those with lower levels of education may underreport (Macdiarmic and Blundell 1998), the differences for vegetables, fruits and cheese would be smaller, and for fats and oils (added lipids) and meat larger. In contrast, if we assume that higher social classes tend to underreport (Hirvonen et al. 1997), the probable effect would be that the educational differences in reality are larger for vegetables, fruits and cheese, and smaller for added lipids and meat. We should also consider that the traditional sampling and data collection methods exclude those belonging to lower social classes (Turrell and Najman 1995) and, therefore, the disparities in food habits are probably larger than reported.

The socioeconomic differences in food habits throughout Europe are heterogeneous and it is difficult to draw conclusions about the regional patterns. The results indicate disparities in consumption of vegetables, fruit and dairy produce in the North of Europe. According to food balance sheets the consumption levels of vegetables are low but those of milk and dairy products high in the area (FAO 1999). Results from studies in the South, where the consumption of vegetables, fruits and vegetable oil have been higher than in the rest of Europe, indicate that people with higher education may consume less of these foods. The findings suggest that in countries where certain foods are common and traditional the lower social

classes tend to consume more of these than the higher social classes. The differences in consumption of traditional and modern foods in relation to social class have been shown in Finland (Roos et al. 1996). Higher socioeconomic groups consumed more of modern recommended foods, such as vegetables and fruit, but less of traditional recommended foods, such as bread and potatoes.

The finding that those with higher educational levels tend to have healthier diets, and especially consume more fruit and vegetables in the North and the West, is supported by previous studies in Northern and Western European countries (Hulshof et al. 1991, Marmot et al. 1991, Osler 1994, Hupkens et al. 1995, Prättälä 1995, Roos 1998, Johansson et al. 1999) and by a comparative study based on the Eurobarometer surveys in eleven EU countries (Cavelaars 1998).

Hupkens et al. (1995) compared eating and drinking habits in various regions in the Netherlands, Germany, Belgium and France. They concluded that men from higher social classes consumed more fruit and vegetables in all the areas whereas for women there were no differences by social class but by region. In our study we have not compared absolute differences between countries but examined differences in patterns. We have reported results separately for men and women but have combined them when drawing conclusions.

Prättälä (1995) compared social class and food in the Nordic countries. She concluded that there was not much variation by social class on the nutrient level whereas food consumption varied more clearly. Typical for Nordic countries was that upper social classes consume more fruit, vegetables and cheese than lower classes and women had healthier diets than men.

Cavelaars (1998) showed educational differences in infrequent vegetable consumption. Among men inequalities in vegetable consumption were large in the more northern countries and small or even non-existent in the southern countries. Among women the size of inequality varied between countries. For all countries except the Netherlands and Greece, a lower consumption of fresh vegetables was found among lower educated women. This pattern was seen as possibly linked to structural characteristics such as the availability of fresh vegetables. In Southern Europe fresh vegetables are more easily available and less expensive. The role of traditional dietary habits and the extent to which different social groups adhere to these were also considered.

The findings of our study indicate that there is a tendency for those with lower education to consume somewhat more meat. Some previous studies have reported opposite results. Norwegian data have shown that higher socioeconomic groups had higher meat consumption than lower groups (Wandel 1997). However, the difference had diminished compared to the 1970s, because consumption of meat had decreased in the highest group and increased in the lowest group.

The foods in which socioeconomic differences in consumption levels were found have a central role in diet-related diseases. Since inequalities in health are partly derived from differences in health behaviour (including food behaviour) and lifestyle, food disparities in relation to consumption levels could possibly explain some of the higher inequality in morbidity and mortality in Scandinavia (Mackenbach et al. 1997).

6. CONCLUSIONS

The main results of this analysis are:

- There are data available on socioeconomic differences in food consumption and nutrient intake, but very limited data on meal patterns. The scattered and heterogeneous nature of available data limits comparison and in-depth analysis.
- The results of the qualitative analysis and meta-analysis support with some exceptions that people belonging to higher social classes have healthier diets. Those with higher education, with the exception of the South, tend to consume more vegetables and fruits and less fats and oils. However, they also eat more cheese.
- The socioeconomic differences in food consumption are not homogenous across Europe. The patterns vary by food group and region.

6.1. Further research

To be able to assess changes in disparities in food habits, more information is needed on trends in socioeconomic differences in food habits in various European countries.

To obtain a better understanding of the disparities in food habits across Europe it would be useful to collect new comparable data. Future surveys should include at least the following variables measuring socioeconomic status: education, occupation and household composition.

Inequalities in health have, in addition to structural factors, been explained by differences in health behaviour and lifestyle. However, the role of variation in behaviour and lifestyle among social groups is not well understood. Studies on socioeconomic differences in food habits in relation to other health behaviour (exercise, smoking, alcohol consumption) could add to a better understanding of their role in health inequalities.

There is a clear lack of information on meals although knowledge about these is important for the understanding of food habits. The limited results suggest that there may be disparities in relation to meals in Europe. However, more information on the time of the meal or eating event, the social setting of meals, and kind of dishes consumed (cold/cooked, self-prepared/ convenient/fast-food) is needed.

Emphasis on the development of sampling and data collection methods that are appropriate to use with various groups, for example, immigrants and those with low education, will be necessary in the future for a more complete overview of socioeconomic differences in food habits.

6.2. Recommendations to policy makers

The nature and magnitude of food-related disparities should be taken into account in planning food and nutrition policies and dietary interventions aimed at promoting health among underprivileged population groups.

The differences in the patterns of food disparities between regions need to be considered when efforts to improve nutrition and health among risk groups are planned. In Northern Europe it could, for example, be effective to address the question of how to increase the vegetable consumption of those with low education. In the South, the traditional diet includes vegetables and vegetable oils, and it would therefore be relevant to find out how best to maintain the healthy traditional diet and to prevent low socioeconomic groups from adapting "Northern" habits.

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APPENDIX 1

Project flow chart

FAIR-97-3096 project "Compatibility of the Household and Individual Nutrition Surveys in Europe and Disparities in Food Habits". Tasks 4 and 5 belong to the Disparities part of the project.

T 1. Provision of data
- ST 1.1. Data collection
- ST 1.2. Provision of clarification

T 2. Statistical analysis of data from HBS and INS
- ST 2.1. Development of data management software
- ST 2.2. Performance of statistical analysis

T 3. HBS & INS analysis on nutritional disparities
- ST 3.1. Development of data management software
- ST 3.2. Performance of statistical analysis
- ST 3.3. Analysis of nutritional disparities

T 4. Identification of data sources for disparities in food habits
- ST 4.1. Literature search
- ST 4.2. Questionnaire
- ST 4.3. Delivery of information
- ST 4.4. Preparation of data reports

T 5. Integration of findings on disparities in food habits
- ST 5.1. Qualitative review and tabulation
- ST 5.2. Meta-analysis

T 6. Production of a report on "Compatability"

T 7. Production of a report on "Disparities"

T = task
ST = sub-task

APPENDIX 2

Table 2.2. Proportion of fat from vegetable and animal sources in 15 European countries based on food balance sheets 1985-1996.

Country	Year	Fat from vegetable sources (%)	Fat from animal sources (%)
Denmark	1985-88	20	80
	1989-92	20	80
	1993-96	18	82
Finland	1985-88	21	79
	1989-92	24	76
	1993-96	26	74
Norway	1985-88	33	67
	1989-92	33	67
	1993-96	33	67
Sweden	1985-88	39	61
	1989-92	40	60
	1993-96	41	59
Estonia	1985-88	-	-
	1992 [a)]	11	89
	1993-96	29	71
Lithuania	1985-88	-	-
	1992 [a)]	15	85
	1993-96	17	83
Poland	1985-88	22	78
	1989-92	24	76
	1993-96	35	65
Hungary	1985-88	21	79
	1989-92	25	75
	1993-96	32	68
UK	1985-88	35	65
	1989-92	38	62
	1993-96	40	60
Germany	1985-88	34	66
	1989-92	37	63
	1993-96	41	59
Netherlands	1985-88	42	58
	1989-92	44	56
	1993-96	44	56
Bel-lux	1985-88	35	65
	1989-92	37	63
	1993-96	41	59
Switzerland	1985-88	33	67
	1989-92	35	65
	1993-96	37	63
Spain	1985-88	59	41
	1989-92	59	41
	1993-96	60	40
Greece	1985-88	63	27
	1989-92	64	26
	1993-96	63	27

[a)] No information before 1992

Source: FAO 1999

Food balance sheet data

Table 2.1. Food consumption in 15 European countries based on food balance sheets (kg/person/year) 1985-1996.

Country Pop. 1996	Year	Vegetables + pulses[a)]	Fruit[a)]	Vegetable oils	Animal fats	Butter	Milk[b)]	Meat + offals
Denmark	1985-88	80.4	72.3	10.5	23.9	7.1	226.1	95.5
5.2 mill.	1989-92	79.6	78.4	9.9	26.8	4.8	227.3	102.3
	1993-96	82.6	72.5	8.0	26.9	2.3	205.7	102.2
Finland	1985-88	50.3	83.4	7.4	16.6	9.7	316.1	66.6
5.1 mill.	1989-92	57.7	94.0	8.9	14.9	7.5	337.6	66.5
	1993-96	65.6	82.7	9.6	14.0	6.8	343.2	64.5
Norway	1985-88	57.0	103.2	12.6	18.0	4.4	294.7	53.7
4.3 mill.	1989-92	58.2	106.1	12.0	18.3	3.1	267.5	53.8
	1993-96	61.6	117.4	12.3	17.5	2.6	265.1	60.5
Sweden	1985-88	56.8	85.4	14.9	18.7	6.8	360.6	60.6
8.8 mill.	1989-92	64.0	100.2	14.6	18.8	5.4	357.2	61.6
	1993-96	65.9	95.8	16.7	19.2	4.8	363.3	66.2
Estonia	1985-88	-	-	-	-	-	-	-
1.5 mill.	1992[c)]	60.6	26.6	1.8	8.2	5.8	348.5	61.5
	1993-96	55.4	50.7	6.8	7.7	5.0	280.9	52.5
Lithuania	1985-88	-	-	-	-	-	-	-
3.7 mill.	1992[c]	65.0	29.7	2.3	18.6	7.2	144.0	70.6
	1993-96	67.8	40.8	1.8	12.8	4.4	154.7	57.9
Poland	1985-88	117.6		7.1	25.2	8.8	245.9	72.3
38.6 mill.	1989-92	123.4		7.6	21.1	7.0	220.8	77.7
	1993-96	126.6		11.4	15.0	4.0	190.6	72.8
Hungary	1985-88	90.6	29.2	8.4	33.4	2.6	195.1	104.4
10.0 mill	1989-92	90.5	34.9	11.0	31.3	1.9	185.7	104.1
	1993-96	95.2	42.9	13.8	26.0	1.5	163.9	91.6
UK	1985-88	91.2	70.6	13.4	12.3	4.8	227.1	76.8
58.4 mill.	1989-92	98.5	78.0	15.0	10.5	3.6	223.8	76.5
	1993-96	96.1	81.8	16.1	9.6	3.4	220.4	76.4
Germany	1985-88	78.2	115.2	12.9	20.7	9.5	232.6	104.2
81.9 mill.	1989-92	83.6	129.8	14.4	20.1	7.4	230.3	97.4
	1993-96	81.6	116.5	16.7	20.1	7.0	235.8	89.0
Netherlands	1985-88	79.8	111.2	17.2	13.6	3.8	315.6	80.7
15.6 mill.	1989-92	77.2	144.9	17.7	11.9	3.5	312.6	83.6
	1993-96	84.7	142.7	17.0	8.4	1.9	331.5	90.5
Bel-lux	1985-88	94.0	92.5	18.3	28.1	8.8	195.7	100.9
10.6 mill.	1989-92	102.9	137.1	19.7	30.1	7.8	206.1	99.9
	1993-96	121.3	125.6	21.8	26.9	6.5	198.9	96.4
Switzerland	1985-88	88.7	126.0	14.7	11.9	6.8	327.5	90.5
7.2 mill.	1989-92	87.2	124.5	15.3	10.5	6.3	330.9	86.9
	1993-96	86.9	120.4	15.7	10.4	6.1	325.8	78.9
Spain	1985-88	150.6	130.3	23.6	3.6	0.5	160.6	85.3
39.7 mill.	1989-92	168.7	147.4	25.9	4.9	0.6	154.0	97.1
	1993-96	141.4	123.3	27.0	4.1	0.3	161.7	103.1
Greece	1985-88	220.6	186.4	26.2	2.4	0.9	218.6	75.5
10.5 mill.	1989-92	235.9	200.5	28.4	2.4	1.0	230.9	77.0
	1993-96	239.0	205.4	28.0	3.4	1.0	246.8	80.1

[a)] Quantities of vegetables, pulses and fruit are expressed in equivalent of fresh, unprocessed products.
[b)] Data on milk include liquid milk and milk products expressed in liquid milk equivalents.
[c)] No information before 1992.

Source: FAO 1999

APPENDIX 3

FAIR-97-3096

COMPATIBILITY OF THE HOUSEHOLD
AND INDIVIDUAL NUTRITION SURVEYS IN EUROPE
AND
DISPARITIES IN FOOD HABITS

BIBLIOGRAPHY

DISPARITIES IN FOOD HABITS 1987-1997

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Contents

Introduction

Social and economic changes during the past 10 years in Europe have resulted in greater differences in food habits within the countries and unexpected pockets of poverty even in the earlier welfare countries. The objectives of the Disparities part of the of the FAIR-97-3096 project "Compatibility of The Household and Individual Nutrition Surveys in Europe and Disparities in Food Habits" are to compare, with the help of existing data sources, food-related disparities in European countries.

The first task of the Disparities part was to identify available data sources through literature searches and a questionnaire to researchers. The aim was to find large-scale comparative studies on educational and/or occupational differences in food habits in Europe. A literature search was performed to identify studies in the 11 participating European countries (Belgium, Denmark, Estonia, Finland, Germany, Greece, Lithuania, Norway, Spain, Sweden, United Kingdom) and the countries of potential associate members and collaborators (the Netherlands, Ireland, Poland). Key words were developed (see below) and references were located by computerised literature searches of databases and by asking researchers in a questionnaire to provide information on references and relevant studies.

This report presents a more detailed description of the literature search methods as well as the results of the pursuit, i.e. a bibliography on disparities in food habits in Europe over a 10-year period, 1987-1997. Relevant publications known to be in press at the time of the literature search were also included. The references are listed at the end in alphabetical order, but also organised according to type of study and country.

Key words

The following key words were used in the literature searches:

Disparities -- socioeconomic factors

- education
- occupation, profession
- gender
- social class
- region, locality, urban/rural area
- ethnic group, ethnicity
- poverty, income
- (un)employment

Food habits -- food, food habits, food patterns

- meal, meal patterns
- nutrients, energy
- nutrition, nutritional status
- diet, diet surveys, dietary habits
- eating

Countries

- Belgium, Denmark, Estonia, Finland, Germany, Greece, Lithuania, Norway, Spain, Sweden, United Kingdom (England, Scotland, Great Britain)
- the Netherlands, Ireland, Poland

Literature search methods

Publications on disparities in food habits from the last ten years, starting in 1987, were identified using several methods, including a questionnaire to researchers, computerised literature searches and by consulting documentation centres, recent books and issues of the most relevant journals.

A. Questionnaire on data sources sent to participating researchers (see Questionnaire I, "Identification of data sources for disparities in food habits in Europe", Appendix 4).

B. A literature search through the 'Documentation Centre Socio-Economic Inequalities in Health (SEIH)' at the Erasmus University in Rotterdam. The following specific key words were used: food habits, nutritional status and all countries except the United States.

Of the 158 references received approximately 40 were included. References were excluded if the title referred to a country which is not included in the list of countries. The following criteria were also used to eliminate references:

- abstract and/or title should refer to differences/disparities in food habits;
- publications should include empirical results on differences or discuss differences;
- the focus should be on disparities in food habits (NOT risk factors for CVD, cancer, other diseases or BMI, health status, breast feeding, dental health, health and nutrition education);
- if the abstract does not include information on differences or comparison of different groups it should be excluded.

C. Literature searches through Medline (all publications 1986 - 1997) using the key words described above.

The searches produced hundreds of references, but several of them did not seem relevant. The above mentioned criteria were used in eliminating references (see section B).

D. Literature searches through other computerised databases using the key words described above.

The following computerised data bases were searched:

- Database UnCover (key words: diet or meal or food, and socio-economic).
- Social Science Search
- Social Science Citation Index
- Nutrition Abstracts

The criteria mentioned in section B were used in eliminating references.

E. Tracking down references.

F. Consulting recent books and the recent issues of the most relevant journals.

G. Consulting experts in the field of disparities in food habits.

Results: description of references

A numbered alphabetic list of 165 references begins on page 86.

The main question guiding the description of the references was: "Are there large scale comparative studies on the nature and magnitude of educational and/or occupational differences in food habits in Europe?" The references in this bibliography form the answer to this question. No large-scale study that focuses on comparing food disparities in Europe was identified. However, the bibliography includes large and small-scale comparative studies that have included some aspects of food disparities.

Below, the references are grouped based on the following characteristics: comparative studies and country. The numbers in parentheses refer to the number of the reference in the alphabetical list presented at the end.

Comparative studies

- DAFNE I-II (6, 94, 147, 149, 150, 151, 152, 165)
  Data Food Networking - European food data bank based on Household Budget Surveys: Belgium, Germany, Greece, Hungary, Ireland, Luxembourg, Norway, Poland, Spain and the United Kingdom. Data on food availability by education available for Belgium, Greece, Hungary, Luxembourg, Poland and Spain.

- SENECA (40, 91, 123, 124, 126, 127, 134)
  Food habits of elderly Europeans in 19 towns in 12 countries: Belgium, Denmark, France, Greece, Hungary, Italy, Netherlands, Norway, Portugal, Spain, Switzerland, Poland.

- EPIC (118)
  Multi-centre prospective cohort study designed to investigate the relation between diet, nutritional and metabolic characteristics, various lifestyle factors and the risk of cancer. 22 centres in 9 countries: United Kingdom, France, Netherlands, Spain, Italy, Greece, Germany, Denmark, Sweden.

- Pan-EU survey of consumer attitudes to food, nutrition and health (47, 83, 86)
  15 EU member states: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

- Socioeconomic differences in health indicators in the EC (24, 25)
  Based on Eurobarometer surveys in EC countries: Great Britain, Ireland, Denmark, Germany, Netherlands, Belgium, France, Spain, Portugal, Italy, Greece.

- Alcohol consumption in the EC (60, 75, 76)

- Social class and food in the Nordic countries (112)
  Countries: Denmark, Finland, Norway, Sweden

- Social class differences in eating and drinking behaviours (59, 61, 62, 63)
  (Netherlands, Belgium, Germany)

- Food consumption in Germany and Great Britain (128, 129, 130, 131)

- Nutrition and poverty review (35)

- Meal patterns (2, 31, 66)

Country

- Belgium (6, 94,125)

- Denmark (3, 33, 36, 41, 51, 54, 87, 99, 100, 101, 102, 103, 104, 112)

- Estonia (72)

- Finland (56, 74, 78, 112, 113, 114, 119, 120, 121)
- Germany (8, 45, 67, 71, 77, 128, 129, 130, 131, 146, 160, 163)
- Greece (6, 94, 148, 153, 154)
- Lithuania (32, 48, 106, 107, 108, 109)
- Norway (50, 68, 69, 70, 79, 97, 105, 112, 158)
- Spain (6, 94, 88, 94, 156)
- Sweden (10, 11, 38, 39, 52, 53, 65, 66, 98, 112, 122)
- United Kingdom (England, Scotland, Great Britain)
  (4, 5, 7, 12, 15, 16, 17, 22, 26, 27, 30, 34, 42, 46, 49, 66, 82, 84, 92, 95, 96, 110, 115, 116, 117, 128, 129, 130, 131, 138, 139, 140, 142, 143, 155, 159, 161, 162)
- The Netherlands (19, 24, 25, 57, 58, 59, 61, 62, 63, 157)
- Ireland (73)
- Poland (6, 94, 28, 90, 132, 133, 144, 145)
- Switzerland (37)
- Czech Republic (44)
- Hungary (13)

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APPENDIX 4

COMPATIBILITY OF THE HOUSEHOLD AND INDIVIDUAL NUTRITION SURVEYS IN EUROPE AND DISPARITIES IN FOOD HABITS

Deadline for return: 5 November 1997

Questionnaire I to researchers

IDENTIFICATION OF DATA SOURCES FOR DISPARITIES IN FOOD HABITS

General

Name/title: _____

Address: _____

_____

_____

Telephone: _____

Telefax: _____

E-mail: _____

Disparities in food habits

The working definition we have used in literature searches for disparities in food habits is:

Differences in meal patterns, food patterns and/or nutrients based on region, ethnic group, educational level and/or occupational status. Gender is included when information available especially if disparities are different for male and female.

What do you understand by disparities? (What would you include under disparities?)

☐ Region
☐ Ethnic group
☐ Educational level
☐ Occupational status
☐ Gender
☐ Other, what? _____

What do you understand by food habits?
☐ Meal patterns
☐ Food patterns
☐ Nutrients
☐ Other, what? _____

Do you have any comments related to the working definition?

_____

_____

_____

_____

_____

Research interests related to disparities in food habits

What are your individual research interests in relation to food-related disparities?

_____

_____

_____

_____

_____

What tasks of the project would you like to participate in?
☐ Participate in plenaries and meetings
☐ Give comments on reports and reviews
☐ Deliver information on references, data sources, own research interests and projects
☐ Write chapters on topics of your choice. What topics? _____

_____

☐ Secondary statistical analyses of existing data

Access to relevant data sources

A. Relevant data sets you have access to (data sources you can analyse or are able to provide e.g. crosstabulations on):

Name of study			
Year			
Sample size			
Disparities:			
-Region	yes/no	yes/no	yes/no
-Ethnic group	yes/no	yes/no	yes/no
-Educational level	yes/no	yes/no	yes/no
-Occupational group	yes/no	yes/no	yes/no
-Gender	yes/no	yes/no	yes/no
-Other variables, what?			
Food habits:			
-Meal patterns	yes/no	yes/no	yes/no
-Food patterns	yes/no	yes/no	yes/no
-Nutrients	yes/no	yes/no	yes/no
-Other variables, what?			

B. Other relevant large data sets in your own country:

Name of study			
Year			
Sample size			
Disparities:			
-Region	yes/no	yes/no	yes/no
-Ethnic group	yes/no	yes/no	yes/no
-Educational level	yes/no	yes/no	yes/no
-Occupational group	yes/no	yes/no	yes/no
-Gender	yes/no	yes/no	yes/no
-Other variables, what?			
Food habits:			
-Meal patterns	yes/no	yes/no	yes/no
-Food patterns	yes/no	yes/no	yes/no
-Nutrients	yes/no	yes/no	yes/no
-Other, what?			

Relevant references

Do you have personal publications related to disparities in food habits from the last five years? Please, give the references (authors, title, journal, year, volume, pages). If possible, please, enclose reprints.

Please, give at the most five in your opinion relevant references related to disparities in food habits in Europe (authors, title, journal, year, volume, pages).

What results do you expect of this project?

Other information

Do you know other researchers interested in this topic to whom we could send the questionnaire? (name, address, e-mail)

Please supply any other information that you feel would be useful to us in identifying data sources for disparities in food habits.

THANK YOU!

Deadline for return: 5 November 1997

Please return to:

Gun Roos
Finnish National Public Health Institute
Department of Epidemiology and Health Promotion
Mannerheimintie 166
FIN-00300 Helsinki
Finland

Phone: +358 9 4744 636
Fax: +358 9 4744 338
E-mail: Gun.Roos@ktl.fi

APPENDIX 5

Respondents of Questionnaire I

Characteristics of researchers who responded to Questionnaire I ("Identification of data sources for disparities in food habits", Appendix 4).

Number of respondents	27	
Countries	16	
Gender of respondents	16	women
	11	men
Titles of respondents	23	Dr., Ph.D. or Prof.
	2	Director
	1	Adviser
	1	Missing
Organisations of respondents	❑	National food and nutrition institutes and other national agencies
	❑	Universities, Departments of public health, epidemiology, social policy, nutrition, preventive medicine
	❑	International organisation (1)
	❑	Other institutes and organisations (3)

APPENDIX 6

20.5.1998

FAIR-97-3096
COMPATIBILITY OF THE HOUSEHOLD AND INDIVIDUAL NUTRITION SURVEYS IN EUROPE AND DISPARITIES IN FOOD HABITS

INSTRUCTIONS FOR HOW TO CHOOSE REPORTS FOR THE DISPARITIES REVIEW

The reports collected based on the criteria below will be included in the detailed reviews described in the Technical Annex Task 5: "Integration of findings on disparities in food habits." The instructions include a list of variables and criteria that studies have to fulfil and definitions of the obligatory, highly recommended and optional variables.

Fill in one copy of the attached form "Report on disparities in food habits" for each report which fulfils the criteria. The main emphasis is on published reports, but you can also include unpublished data if you have access to data and can produce the requested information by September 1998.

LIST OF VARIABLES AND CRITERIA

1) For a study or published report to be included it must fulfill the following criteria: the subjects must be **adults** (18-65 years) and the period of a study (data collection) **1985-1997**.

The following variables are **obligatory**:

-education and/or occupation
-age
-gender
-food groups/items

2) In addition, the following is **highly recommended**:
   -energy yielding nutrients
   -meal frequency

3) The following is **optional**:
   -region
   -ethnic group
   -urban/rural
   -religion
   -income
   -(un)employment
   -food-related values, attitudes, beliefs
   -fish
   -alcoholic beverages
   -food supplements

DEFINITION OF CRITERIA AND OBLIGATORY VARIABLES

EDUCATION AND OCCUPATION

Reports to be selected must include variables with information on the participants' education or occupation. It must also be possible to provide information on food habits for at least three different educational or occupational groups, either based on published tables and reports or if published information is not available you are expected to produce tables with the necessary information. The only exceptions are reports specifically focused on the poor and underprivileged groups. However, these reports have to describe the educational or occupational status of the group.

If both education and occupation are included in the same report, please deliver the distributions by both education and occupation.

Education

Educational level is in general measured by the highest level of education that has successfully been completed. Education can be reported as number of school years or education levels.

Education has to be reported as at least three educational levels, but more detailed information can be provided whenever possible. For example:

-primary, secondary, university
-basic or less, secondary, higher
-low, intermediate, high

-<10 years, 10-12 years, 13+ years

-elementary incomplete, elementary completed, secondary incomplete, secondary completed, university

-no education, primary education, lower secondary education, upper secondary education, post-secondary education

Occupation

Occupation is a comprehensive socioeconomic indicator but difficult to measure. The problems are how to classify persons with different jobs according to their place in the social hierarchy, how to deal with economically inactive men, and how to classify women (according to their own or their partner's occupation).

Occupation has to be reported as at least three broad classes. For example:

-non-manual, manual and farmer
-white-collar, blue-collar and farmer
-upper white-collar, lower white-collar, workers, entrepreneurs, farmers
-professional, intermediate managerial and technical, lower non-manual, skilled manual, unskilled manual
-low, middle, high

Women or men can be classified either according to their own or their partner's occupation. Please, do not forget to describe on what basis individuals or households have been classified when you fill in the questionnaire form.

In some international comparisons the classification scheme chosen has been the EGP (Erikson-Goldthorpe-Portocarero) social class scheme. This scheme which originally has ten occupational classes has been collapsed into a 7-class scheme for comparative research.

Age

The study population should be 18-65 years old. The limits are not absolute and studies which have some respondents who are younger or older can be included. However, reports and studies focusing primarily on children and adolescents or people over 65 should be excluded.

The goal is to be able to divide the sample into 3 age groups:

-young adults (for example, 18-34 years)
-middle aged adults (35-54 years)
-older adults (55-65 years)

If educational and/or occupational differences are presented by different age groups these tables should be included.

Gender

Gender is obligatory except for household budget surveys. Reports focusing on one gender (men or women) are also included.

Educational and/or occupational differences in food habits have to be presented separately for men and women if the report includes both genders.

Food groups/items

Because there are so many food items and it is difficult to compare food groups we will focus on a few food groups: fruits, vegetables, fats and oils (added lipids), meat and dairy (cheese, milk and sour milk). These indicator foods have been chosen because they play an important role in public health.

The report has to at least include information on educational or occupational differences in frequency or quantity or yes/no of consumption of one or more of the indicator foods (fruits, vegetables, fats, meat and dairy).

The food groupings and their descriptions are largely based on the food grouping system used in DAFNE. The detailed descriptions below are included to help you recognize what is included in the various food groups. However, you do not have to be able to produce separate tables for each type of food, it is enough with 1-2 categories per food group. For example, you may have one group called fruits or if possible at the most two labeled fresh and processed fruits.

Fruits:
Information on consumption of fruits (and berries) as such or if possible separately fresh fruits and other (processed).

DAFNE:
-fresh fruits
  -apples
  -citrus fruits
  -bananas
  -strawberries
  -grapes
  -cherries
  -peaches and apricots
  -pears
  -plums
  -other fresh fruits
-processed fruits e.g. dried, frozen, canned, preserved, fruit juices

Vegetables:
Information on consumption of vegetables as such or if possible separately fresh vegetables and other (processed).

DAFNE:
-fresh vegetables
  -fresh leafy vegetables
  -cabbages
  -tomatoes
  -carrots
  -other fresh vegetables
  -onions, garlic
-processed vegetables, e.g. olives, pickles, frozen, canned
-pulses

Fats and oils (added lipids):
Some measure of vegetable fat (e.g. vegetable oil) and animal fat (e.g. butter) or information on saturated versus unsaturated fatty acids. Information on type of bread spread and fat used in food preparation can also be included.

DAFNE:
Total added lipids:
-lipids of animal origin
  -butter
  -lipids of animal origin (butter excluded)
-lipids of vegetable origin
  -vegetable oils
  -vegetable fats (margarine included)

Meat:
Meat reported as one category including red meat, poultry, offal, meat products and dishes.

DAFNE:
-red meat
    -pork meat
    -beef, veal and calf meat
    -red meat other than pork and beef
-poultry
-offals
-meat products e.g. sausages, ham, bacon
-meat dishes e.g. roasted meat, canned dishes, meat pie, pizza

Dairy:
Information on dairy in two categories: cheese and milk (includes both milk and sour milk).

DAFNE:
-cheese
-milk
-other dairy products (cheese and milk excluded), e.g. yogurt, ice cream

DEFINITION OF HIGHLY RECOMMENDED VARIABLES

Energy yielding nutrients
As percentage of total energy
-fat
  -saturated fat
-carbohydrates
  -sugar
-protein
-alcohol

Meal frequency
Number of eating occasions per day.

APPENDIX 7

27.5.1998

FAIR-97-3096

COMPATIBILITY OF THE HOUSEHOLD AND INDIVIDUAL NUTRITION SURVEYS IN EUROPE AND DISPARITIES IN FOOD HABITS

REPORT ON DISPARITIES IN FOOD HABITS

*(Fill in one form for **each** report)*

Name of the person completing this questionnaire: _____

_____

Country: _____

Name of the study/survey: _____

_____

Data source:

☐ Publication or report from which data has been taken: _____

_____

_____

_____

_____

☐ Unpublished data. Contributors:

_____

_____

1. DATES OR YEAR OF DATA COLLECTION:

_____

2. SAMPLE

2.1. What kind of sample design was used (e.g. random, stratified or opportunistic sampling)**?**

_____

_____

2.2. Was the sampling method used to achieve or ensure national or regional representativeness?

☐ Yes. Which was the targeted country or region? _____
☐ No

2.3. Was cluster sampling used?

☐ Yes. Which were the clusters? _____
☐ No

2.4. If a complex multistage sampling was used, please, describe: _____

_____

_____

2.5. Which were the sampling units (clusters, e.g. whole buildings or lots in a city, or individuals)**?**

_____

2.6. Which were the sampling points (e.g. towns, lots or neighborhoods)? _____

_____

2.7. If selected subjects did not accept the participation, were they replaced by other subjects?

☐ Yes
☐ No

2.8. When available, the following information should be reported:

2.8.1. Were quota applied to the selection of the sample?
☐ Yes. On which variables were the quota applied? _____

_____

☐ No

2.8.2. Was a weighted procedure used to analyse the sample?
☐ Yes. By which variables was the sample weighted? _____

_____

☐ No

2.8.3. What sampling approach was used?
☐ Probabilistic
☐ Pseudo-probabilistic (i.e. random routes)
Please, describe the method: _____

2.9. Which were the eligibility and exclusion criteria?

_____

_____

3. NUMBER OF RESPONDENTS (women, men and/or households) **AND RESPONSE RATE** (% of total invited subjects)

	Number (N)	**Response rate (%)**
Women		
Men		
TOTAL (men and women)		
Households		

4. WHAT AGES OR AGE GROUPS WERE INCLUDED?

5. SES VARIABLES AND CRITERIA

Reminder: The report must provide information on food habits for at least three different educational or occupational groups or you have to be able to produce the requested information by September 1998 (See instructions page 2).

5.1. How was education measured?

☐ number of school years
☐ educational levels

List the categories used in the report (in English and the native language):

5.2. How was occupation measured?

List the categories used in the report (in English and the native language):

5.3. How was income measured?

_____

_____

_____

_____

5.4. Other variables

Include only if they have been used in the report and tables on food habits.

☐ Region, what variables? _____

_____

☐ Ethnic group, what variables? _____

_____

☐ Urban/rural, what variables? _____

_____

☐ Religion, what variables? _____

_____

☐ Employment status, what variables? _____

_____

6. DIETARY ASSESSMENT METHODS

6.1. What kinds of dietary assessment methods were used? (one study can have several methods)

☐ Dietary records
- ☐ weighed dietary record. How many days were recorded: _____
- ☐ non-weighed dietary record. How many days were recorded: _____
- ☐ other dietary records. Please, specify: _____

☐ Short-term dietary recall
- ☐ 24-hour dietary recall. Number of recalls/person: _____
- ☐ 48-hour dietary recall. Number of recalls/person: _____
- ☐ Other short-term dietary recalls. Please, specify: _____

☐ Diet history

☐ Food frequency
Number of food items: _____

☐ Household purchases
- ☐ Food account method
- ☐ Inventory method
- ☐ List recall method
- ☐ Interview
- ☐ Other. Please, specify: _____

What kind of units were used (e.g. monetary units, weights) _____

_____

☐ Other methods. Please, specify: _____

_____

_____

_____

_____

6.2. What procedure (interview or questionnaire) was used?

☐ Interview

Who was the interviewer?

☐ Nutritionist

☐ Other interviewer. Please, specify: _____

How was the interview administered?

☐ Personal face-to-face interview

☐ By telephone

Average duration of the interview: _____ minutes.

☐ Questionnaire

How was the questionnaire administered?

☐ Self-administered

☐ Self-administered with assistance

☐ Other procedure. Please, specify: _____

6.3. Was a previously published interview form or questionnaire (e.g. Block questionnaire, Willett questionnaire) **used?**

☐ Yes. Please, specify: _____

☐ No

6.4. Was the method (interview form or questionnaire) **validated for that country?**

☐ Yes. Please, specify: _____

☐ No

6.5. Where photographs or models used to assess portion sizes?

☐ Yes. Please, specify: _____

☐ No

7. FOOD GROUPS/ITEMS

7.1. Fruits

7.1.1. Does the report include information on the consumption or availability of fruits?

☐ Yes
☐ No (go to 7.2.)

Please, describe the questions used in data collection (or enclose interview, questionnaire or dietary record form):

_____

_____

_____

7.1.2. What kind of information is available on the consumption or availability of fruits?

☐ frequency
☐ quantity (grams per day)
☐ consumed/not consumed

7.1.3. Is information available on the consumption or availability of fruits for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

7.1.4. Which subgroups of the category fruit (e.g. fresh and other) have been used in tables presenting consumption or availability of fruits by socio-economic status?

_____

_____

_____

_____

7.2. Vegetables

7.2.1. Does the report include information on the consumption or availability of vegetables?

☐ Yes
☐ No (go to 7.3.)

Please, describe the questions used in data collection (or enclose interview, questionnaire or dietary record form):

_____

_____

_____

_____

7.2.2. What kind of information is available on the consumption or availability of vegetables?

☐ frequency
☐ quantity (grams per day)
☐ consumed/not consumed

7.2.3. Is information available on the consumption or availability of vegetables for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

7.2.4 Which subgroups of the category vegetables (e.g. fresh and other) have been used in tables presenting consumption or availability of vegetables by socio-economic status?

_____

_____

_____

_____

7.3. Fats and oils (added lipids)

7.3.1. Does the report include information on the consumption or availability of fats and oils (added lipids)

☐ Yes
☐ No (go to 7.4.)

Please, describe the questions used in data collection (or enclose interview, questionnaire or dietary record form):

_____

_____

_____

7.3.2. What kind of information is available on the consumption or availability of fats and oils (added lipids)?

☐ frequency
☐ quantity (grams per day)
☐ consumed/not consumed
☐ type of bread spread
☐ type of fat used in food preparation

7.3.3. Is information available on the consumption or availability of fats and oils (added lipids) for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

7.3.4. Which subgroups of the category fats and oils (added lipids) have been used in tables presenting consumption or availability of fats by socio-economic status?

_____

_____

_____

_____

7.4. Meat

7.4.1. Does the report include information on the consumption or availability of meat?

☐ Yes
☐ No (go to 7.5.)

Please, describe the questions used in data collection (or enclose interview, questionnaire or dietary record form):

_____

_____

_____

_____

7.4.2. What kind of information is available on the consumption or availability of meat?

☐ frequency
☐ quantity (grams per day)
☐ consumed/not consumed

7.4.3. Is information available on the consumption or availability of meat for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

7.4.4. Which subgroups of the category meat have been used in tables presenting consumption or availability of meat by socio-economic status?

_____

_____

_____

_____

_____

7.5. Dairy

7.5.1. Does the report include information on the consumption or availability of dairy (cheese and milk + sour milk)

☐ Yes
☐ No (go to 8.)

Please, describe the questions used in data collection (or enclose interview, questionnaire or dietary record form):

_____

_____

_____

7.5.2. What kind of information is available on the consumption or availability of dairy (cheese and milk + sour milk)?

☐ frequency
☐ quantity (grams per day)
☐ consumed/not consumed
☐ type of cheese or milk used (e.g. skim milk, whole milk, sour milk)

7.5.3. Is information available on the consumption or availability of dairy for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

7.5.4. Which subgroups of the category dairy have been used in tables presenting consumption or availability of dairy by socio-economic status?

_____

_____

_____

_____

8. FOOD HABITS INDEX

8.1. Has a food habits index or score been developed?

☐ Yes
☐ No

Which items (foods, nutrients) have been included in the index?

_____

_____

_____

_____

8.2. Are food index results presented for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

9. ENERGY-YIELDING NUTRIENTS

9.1. Have the data on food consumption been used to derive data on the quantity of intake of energy-yielding nutrients?

☐ No
☐ Yes, the following nutrients:

_____

_____

_____

_____

_____

9.2. Are results presented on the quantity of intake of energy yielding nutrients for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

10. MEALS

10.1. Is information available on the frequency of eating occasions?

☐ No
☐ Yes, using the following questions (you may also enclose a copy of the form or questionnaire):

_____

_____

_____

_____

_____

10.2. Are results on the frequency of eating occasions presented for different groups?

Yes	No	
☐	☐	by education (at least 3 groups)
☐	☐	by education and age
☐	☐	by occupation (at least 3 groups)
☐	☐	by occupation and age

11. OPTIONAL VARIABLES

11.1. Does the report include information on food-related values, attitudes and beliefs?

☐ Yes. please, specify:

_____

☐ No

11.2. Are results on food-related values, attitudes and beliefs presented for different groups?

Yes	No		Yes	No	
☐	☐	by education (at least 3 groups)	☐	☐	by occupation (at least 3 groups)
☐	☐	by education and age	☐	☐	by occupation and age

11.3. Does the report include information on the consumption or availability of fish?

☐ Yes. please, specify:

_____

☐ No

11.4. Is information available on the consumption or availability of fish for different groups?

Yes	No		Yes	No	
☐	☐	by education (at least 3 groups)	☐	☐	by occupation (at least 3 groups)
☐	☐	by education and age	☐	☐	by occupation and age

11.5. Does the report include information on the consumption or availability of alcoholic beverages?

☐ Yes. please, specify:

_____

☐ No

11.6. Is information available of the consumption or availability of alcoholic beverages for different groups?

Yes	No		Yes	No	
☐	☐	by education (at least 3 groups)	☐	☐	by occupation (at least 3 groups)
☐	☐	by education and age	☐	☐	by occupation and age

11.7. Does the report include information on the consumption or availability of food supplements?

☐ Yes. please, specify:

_____

☐ No

11.8. Is information available on the consumption or availability of food supplements for different groups?

Yes	No		Yes	No	
☐	☐	by education (at least 3 groups)	☐	☐	by occupation (at least 3 groups)
☐	☐	by education and age	☐	☐	by occupation and age

APPENDIX 8

Ranking of the studies – criteria[1]

(points 0-12; low points indicate suitable studies)

1. National/regional representativeness of the sample
   - 0 = national representativeness (random sampling, multistage sampling, quota-controlled sampling etc.)
   - 1 = regional representativeness (well-defined region)
   - 2 = representativeness was not specified or cannot be inferred
   - 3 = convenience sampling or non-representativeness acknowledged by authors

2. Response rate
   - 0 = ≥ 80
   - 1 = ≥ 70 and < 80
   - 2 = < 70 or not reported

3. Variable for SES (education, occupation, and social class)
   - 0 = education as number in school years
   - 1 = educational levels
   - 2 = other measures

4. Unit of study
   - 0 = individual
   - 1 = group

5. Core food groups (fruits, vegetables, fats and oils, meat, dairy) included
   - 0 = five core food groups included
   - 1 = three to four core food groups included
   - 2 = one to two core food group included

6. Do the age group included in the study repond to the target age group (18-65 years)?
   - 0 = Yes (falls within 5 years of the target age group = 13-70 years)
   - 1 = No (differs more than 5 years)

7. Is information given on group means, SD, SE, N and other measures needed for calculation of statistical significance?
   - 0 = information given on SD, standard errors or confidence intervals
   - 1 = no information on SD, standard errors or confidence intervals

[1] The criteria for ranking the studies were developed as group work in one of the project's workshops according to the objectives of the study.

Ranking of the studies – table of results

(points 0-12; low points indicate suitable studies)

A. Dietary surveys (g/day or g/10 MJ)

Study No	Country, region	Ranking points							
		1	2	3	4	5	6	7	Total
39	Norway	0	2	0	0	0	1	0	3
28	Finland, 4 regions	1	2	0	0	0	0	0	3
45	Sweden	0	1	1	0	0	1	0	3
7	Denmark	0	1	1	0	0	1	1	4
8	Denmark	0	2	0	0	0	1	0	3
48	UK England, Scotland, Wales	1	2	2	0	0	0	1	6
30	Germany, West incl. West-Berlin	1	1	1	0	0	0	0	3
31	Germany, Augsburg and 2 counties	1	1	0	0	0	0	0	2
37	Netherlands	0	0	1	0	0	1	0	2
38	Netherlands	0	1	1	0	0	1	1	4
41	Spain, Basque County	1	1	1	0	0	0	0	3
42	Spain, Catalonia	1	2	2	0	0	1	1	7
43	Spain, Navarra	1	0	1	0	0	1	0	3

B. Household budget surveys

Study No	Country, region	Ranking points							
		1	2	3	4	5	6	7	Total
1	Belgium, 3 regions	1	2	1	1	0	1	1	7
2	Greece, 9 regions	1	0	1	1	0	1	1	5
5	Greece	1	1	1	1	0	1	1	6
3	Hungary, 19 counties and capital	1	1	1	1	0	1	1	6
4	Poland	0	2	1	1	0	1	1	5
40	Poland	0	2	1	1	0	1	1	6
6	Spain	0	2	1	1	0	1	1	6
44	Spain	1	1	1	1	0	1	1	6

C. Health behaviour surveys (frequency)

Study No	Country, region	Ranking points							
		1	2	3	4	5	6	7	Total
9	Denmark, Copenhagen County	1	1	0	0	1	0	-	3
10	Denmark, Copenhagen County	1	1	0	0	1	0	-	3
11	Estonia	0	1	0	0	1	0	-	2
12	Estonia	0	2	0	0	1	0	-	3
13	Estonia	0	0	0	0	1	0	-	1
14	Estonia	0	1	0	0	1	0	-	2
15	Finland	0	2	0	0	1	0	-	3
16	Finland	0	0	0	0	1	0	-	1
17	Finland	0	0	0	0	1	0	-	1
18	Finland	0	1	0	0	1	0	-	2
19	Finland	0	1	0	0	1	0	-	2
20	Finland	0	1	0	0	1	0	-	2
21	Finland	0	1	0	0	1	0	-	2
22	Finland	0	1	0	0	1	0	-	2
23	Finland	0	1	0	0	1	0	-	2
24	Finland	0	1	0	0	1	0	-	2
25	Finland	0	1	0	0	1	0	-	2
26	Finland	0	1	0	0	1	0	-	2
27	Finland	0	1	0	0	1	0	-	2
33	Lithuania	0	2	0	0	1	0	-	3
34	Lithuania	0	2	0	0	1	0	-	3
35	Lithuania, 5 rural regions	1	2	0	0	0	0		3
36	Netherlands	0	2	1	0	1	1	-	5
46	Sweden	3	2	2	0	2	1	-	10
47	Switzerland	0	1	1	0	1	1	-	4
49	UK England, Scotland, Wales	1	1	2	1	0	1	1	7

APPENDIX 9

Questionnaire II results: CHARACTERISTICS OF THE STUDIES (according to type of study and from north to south)

A. Dietary surveys (g/day or g/10 MJ) (n = 13)

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
39	Norway	NORKOST	1993-1994	Two-stage random sample (16-79 years)	m 1 517 w 1 627 3 144	62 64 63	Education, 8 classes (grouped as 2 or 3 classes) Occupation, 12 classes	Food frequency questionnaire	National Nutrition Council 1997; unpublished data Johansson 1999
28	Finland, 4 regions	The 1992 Dietary Survey of Finnish Adults	1992 spring	Random sample (pop.register) 4 regions (25-64 years)	m 870 w 991 1 861	61 71 66	Education, 3 classes	3 day non-weighed dietary record, food frequency questionaire	Kleemola et al. 1996; Roos et al. 1996; unpublished data
45	Sweden	Swedish National Dietary Survey	1989	Random sample (nat pop. reg.) (19-74 years)	m 753 w 772 1 525	71 69 70	Education, 5 classes Occupation, 5 classes	7 day non-weighed dietary record Household purchases, food account	Becker 1994; Unpublished data Becker 1999
7	Denmark	Dietary Habits in Denmark	1985	Simple random sample (15-80 years)	m 1 086 w 1 156 2 242	75 77 76	Education, 3 classes Occupation, 5 classes	Diet history	Haraldsdottir et al. 1987
8	Denmark	Dietary Habits in Denmark	1995	Random sample (1-80 years) stratified by sex and age (pop. register)	m 904 w 933 1 837	58	Education: school educ (5 classes) and further educ (6 classes) Occupation, 6 classes	7 day estimated food record	Unpublished data Groth and Fagt 1999

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
48	UK England, Scotland, Wales	National Diet and Nutrition Survey (NDNS)	1986-1987	Multi-stage random probability sample (electoral reg) (16-64 years)	m 1 087 w 1 110 2 197	70	(Occupation, 7 classes) Income	7 day weighed dietary record	Gregory et al. 1990
30	Germany, West incl. West-Berlin	German National Food Intake Survey (NVS and VERA)	1985-1989	Multi-stage multi-stratified random sample (German nat.) 4 years-ffq 14 years-Vera 18 years-	m 10 901 w 12 308 23 209	74	Education, 5 classes Occupation, 6 classes	7 day non-weighed dietary record, food frequency questionnaire	Unpublished data (Public use file NVS and VERA)
31	Germany, Augsburg and 2 counties	MONICA Augsburg	1984-1985	Two-stage cluster sample stratified by age (German nat.) (45-64 years)	m 899	70	Education, 4 classes	7 day weighed dietary record	Kussmaul et al. 1995
37	Nether-lands	Dutch Nutrition Surveillance System	1987-1988	Random sample (postal database) (19-85 years)	m 1 930 w 2 204 4 134 hh 2 203	81 79	Education, 3 classes Occupation, 3 classes	2 day non-weighed dietary record	Hulshof et al. 1991

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
38	Nether-lands	Dutch Nutrition Surveillance System	1992	Random sample (1-85 years)	m 2 881 w 3 337 6 218 hh 2 475	 72 72	Education, 3 classes Occupation, 3 classes	2 day non-weighed dietary record	Unpublished data Hulshof 1999
41	Spain, Basque County	Food Habits in Basque Country	1990	Random sample (local hlth units) (25-60 years)	m 1 143 w 1 205 2 348	 73	Education, 4 classes Socio-economic status, 3 classes	Three 24-hour recalls Food frequency	Departemento de Sanidad Gobierno Vasco. Unpublished data Martínez et al. 1998
42	Spain, Catalonia	Assessment of Nutritional Status of Catalonia's Population	1992-1993	Random cluster sample (hlth area) (18-75 years)	m 1 271 w 1 486 2 757	 69	Social class, 3 classes	Two 24-hour recalls Food frequency	Generalitat de Catalunya Department de Sanidad i Seguritat Social. Unpublished data Martínez et al. 1998
43	Spain, Navarra	Food Habits in Navarra's Population	1989-1990	Two-stage random stratified sample (hlth zones) (>= 15 years)	m 367 w 337 704	 95	Education, 3 classes Occupation, 4 classes	Diet history	Gobierno de Navarra Departamento de Salud. Unpublished data Martínez 1998

B. Household budget surveys (n = 9)

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
49	UK England, Scotland, Wales	National Food Survey (NFS)	1985-1989	Three-stage stratified sample (postcode address file)	hh 28 532	64	Social class, 6 classes	Household purchases, food account (7 days)	Ministry of Agriculture, Fisheries and Foods 1986; 1987; 1988; 1989
4	Poland	Polish Household Budget Survey DAFNE I	1988	Two-stage stratified random sample	hh 29 664	60	Education, 5 classes	Household purchases, food account	Trichopoulou and Lagiou 1997
40	Poland	Polish Household Budget Survey	1996	Two-stage sample startified geographicall y	hh 31 907	69	Occupation, 6 classes Education	Household purchases	Unpublished data Sekula 1999
1	Belgium, 3 regions	Belgian Household Budget Survey (DAFNE I)	1987-1988	Subsample stratified by SES and region	hh 3 235	11	Education, 5 classes	Household purchases, food account	Trichopoulou and Lagiou 1997
3	Hungary, 19 counties and capital	Hungarian Household Budget Survey (DAFNE I)	1991	Stratified two- or three-stage sampling	hh 11 813	73	Education, 5 classes	Household purchases, food account	Trichopoulou and Lagiou 1997
6	Spain	Spanish Household Budget Survey (DAFNE II)	1990-1991	Two-stage stratified random sample	hh 21 155	54	Education, 5 classes	Household purchases, food account	Trichopoulou and Lagiou 1998

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
44	Spain	Spanish Household Budget Survey	1990-1991	Two-stage sample	hh 21 155	79	Education, 4 classes Occupation, 6 classes	Diet history (7 days)	Encuesta de Presupuestos familiares 1990-91. Unpublished data Martínez 1998
2	Greece, 9 regions	Greek Household Budget Survey (DAFNE I)	1987-1988	Multistage stratified random sample (census)	hh 6 489	94	Education, 5 classes	Household purchases, food account	Trichopoulou and Lagiou 1997
5	Greece	Greek Household Budget Survey (DAFNE II)	1993-1994	Multistage stratified random sample (census)	hh 6 756	79	Education, 5 classes	Household purchases, food account	Trichopoulou and Lagiou 1998

C. Health behaviour surveys (frequency) (n = 25)

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
15	Finland	Health Behaviour among Finnish Adult Population	1985 spring	Random sample (pop.register) (15-64 years)	m 1 637 w 1 781 3 418	65 72 68	Education, 4 classes Occupation, 7 classes	Questionnaire (28 food-related questions)	Piha et al. 1986a
16	Finland	Health Behaviour among Finnish Adult Population	1986 spring	Random sample (pop.register) (15-64 years)	m 1 902 w 2 187 4 089	78 85 82	Education, 3 classes Occupation, 7 classes	Questionnaire (28 food-related questions)	Piha et al. 1986b; Unpublished data Helakorpi 1999
17	Finland	Health Behaviour among Finnish Adult Population	1987 spring	Random sample (pop.register) (15-64 years)	m 1 873 w 2 170 4 043	76 85 81	Education, 3 classes Occupation, 7 classes	Questionnaire (28 food-related questions)	Niemensivu et al. 1988a; Unpublished data Helakorpi 1999
18	Finland	Health Behaviour among Finnish Adult Population	1988 spring	Random sample (pop.register) (15-64 years)	m 1 884 w 2 001 3 885	74 82 78	Education, 3 classes Occupation 7 classes	Questionnaire (25 food-related questions)	Niemensivu et al. 1988b; Unpublished data Helakorpi 1999
19	Finland	Health Behaviour among Finnish Adult Population	1989 spring	Random sample (pop.register) (15-64 years)	m 1 853 w 2 024 3 877	73 82 78	Education, 3 classes Occupation 7 classes	Questionnaire (25 food-related questions)	Berg et al. 1990a; Unpublished data Helakorpi 1999

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
20	Finland	Health Behaviour among Finnish Adult Population	1990 spring	Random sample (pop.register) (15-64 years)	m 1 811 w 2 001 3 812	73 80 76	Education, 3 classes Occupation 7 classes	Questionnaire (27 food-related questions)	Berg et al. 1990b; Unpublished data Helakorpi 1999
21	Finland	Health Behaviour among Finnish Adult Population	1991 spring	Random sample (pop.register) (15-64 years)	m 1 783 w 2 026 3 809	72 82 76	Education, 3 classes Occupation 7 classes	Questionnaire (27 food-related questions)	Berg et al. 1991; Unpublished data Helakorpi 1999
22	Finland	Health Behaviour among Finnish Adult Population	1992 spring	Random sample (pop.register) (15-64 years)	m 1 733 w 1 981 3 714	69 80 74	Education, 3 classes Occupation 7 classes	Questionnaire (28 food-related questions)	Berg et al. 1993a; Unpublished data Helakorpi 1999
23	Finland	Health Behaviour among Finnish Adult Population	1993 spring	Random sample (pop.register) (15-64 years)	m 1 610 w 1 863 3 473	64 75 70	Education, 3 classes Occupation 7 classes	Questionnaire (15 food-related questions)	Berg et al. 1993b; Unpublished data Helakorpi 1999
24	Finland	Health Behaviour among Finnish Adult Population	1994 spring	Random sample (pop.register) (15-64 years)	m 1 669 w 1 831 3 500	66 75 70	Education, 3 classes Occupation 7 classes	Questionnaire (27 food-related questions)	Helakorpi et al. 1994; Unpublished data Helakorpi 1999

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
25	Finland	Health Behaviour among Finnish Adult Population	1995 spring	Random sample (pop.register) (15-64 years)	m 1 688 w 1 956 3 644	67 79 73	Education, 3 classes Occupation 7 classes	Questionnaire (27 food-related questions)	Helakorpi et al. 1995; Unpublished data Helakorpi 1999
26	Finland	Health Behaviour among Finnish Adult Population	1996 spring	Random sample (pop.register) (15-64 years)	m 1 669 w 1 928 3 597	66 78 72	Education, 3 classes Occupation 7 classes	Questionnaire (27 food-related questions)	Helakorpi et al. 1996; Unpublished data Helakorpi 1999
27	Finland	Health Behaviour among Finnish Adult Population	1997 spring	Random sample (pop.register) (15-64 years)	m 1 588 w 1 928 3 516	64 76 70	Education, 3 classes Occupation 7 classes	Questionnaire (34 food-related questions)	Helakorpi et al. 1997; Unpublished data Helakorpi 1999
46	Sweden	Food Habits and Health Consciousness. A study of young singles	1988-1989	Snowball sample (20-25 years, single)	m 45 w 45 90		Education, 3 classes Occupation, 3 groups	5 day non-weighed dietary record Interview	Jansson 1990
11	Estonia	Health Behaviour among Estonian Adult Population	1990 spring	Random sample (lists of voters) Estonians and non-Estonians (18-70 years)	m 473 w 609 1 085	72	Education, 5 classes Occupation, 7 classes	Questionnaire (19 food-related questions)	Lipand et al. 1992; Finbalt Health Monitor unpublished data 1998

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
12	Estonia	Health Behaviour among Estonian Adult Population	1992 spring	Random sample Estonians and non-Estonians (16-64 years)	m 451 w 497 948	63	Education, 4 classes Occupation, 8 classes	Questionnaire (19 food-related questions)	Lipand et al. 1993; Finbalt Health Monitor unpublished data 1998
13	Estonia	Health Behaviour among Estonian Adult Population	1994 spring	Random sample stratified by age and nationality prior to sampling (16-64 years)	m 536 w 707 1 243	83	Education, 4 classes Occupation, 8 classes	Questionnaire (15 food-related questions)	Lipand et al. 1994; Finbalt Health Monitor unpublished data 1998
14	Estonia	Health Behaviour among Estonian Adult Population	1996 spring	Random sample stratified by age and nationality prior to sampling (16-64 years)	m 676 w 831 1 507	75	Education, 4 classes Occupation, 8 classes	Questionnaire (12 food-related questions)	Kasmel et al. 1997; Finbalt Health Monitor unpublished data 1998
33	Lithuania	Health Behaviour among Lithuanian Adult Population	1994 spring	Random sample (nat.voting reg.) (20-64 years)	m 787 w 1 077 1 864	57 66 64	Education, 5 classes Occupation, 7 classes	Questionnaire (16 food-related questions)	Grabauskas et al. 1997; Finbalt Health Monitor unpublished data 1998

Study No.	Country, region	Name of study	Study year	Sample	n	Response rate %	SES-variables	Dietary assessment method	Reference
34	Lithuania	Health Behaviour among Lithuanian Adult Popul.	1996 spring	Random sample (nat. pop. reg.) (20-64 years)	m 920 w 1 101 2 021	64 72 69	Education, 4 classes Occupation, 7 classes	Questionnaire (18 food-related questions)	Grabauskas et al. 1998; Finbalt Health Monitor unpublished data 1998
35	Lithuania, 5 rural regions	CINDI Programme Screening	1993	Random sample stratified (prim. hlth care reg.) (25-64 years)	m 682 w 876 1 558	46 58 52	Education, 5 classes	Interview (16 food-related questions)	Unpublished data Klumbiené et al. 1998
9	Denmark, Copenhagen County	DAN-MONICA II	1986	Random sample stratified by age (30-60 years)	m 725 w 737 1 462	75	Education, 4 classes Occupation, 5 classes	Food frequency questionnaire	Osler at al.1997; unublished data Osler 1998
10	Denmark, Copen-hagen County	DAN-MONICA III	1993	Random sample stratified by age (30-60 years)	m 777 w 778 1 555	79 73 75	Education, 4 classes Occupation 5 classes	Food frequency questionnaire	Osler and Schroll 1995: unpublished data Osler 1998
36	Nether-lands	Dutch Health Interview Survey	1989	Two-stage stratified random sample (>= 16 years)	m 3 124 w 3 344 6 468	approx. 60	Education, 5 classes	Questionnaire (22 food-related questions)	de Bruin 1991
47	Switzer-land	Diet in Switzerland	1992-1993	Random sample (hh with phone) (15-74 years)	m 7 930 w 7 358 15 288	71	Education, 3 classes	Telephone survey: 15 food-related questions and food frequency (7 foods)	Eichholzer et al. 1995

APPENDIX 10

FAIR-97-3096

COMPATIBILITY OF THE HOUSEHOLD AND INDIVIDUAL NUTRITION SURVEYS IN EUROPE AND DISPARITIES IN FOOD HABITS

DISPARITIES IN FOOD HABITS – study numbers

No.	Country	Year	Study name
A. Dietary surveys (g/day or g/10MJ) (n = 13)			
39	Norway	1993-94	NORKOST
28	Finland	1992	Dietary Survey of Finnish Adults
45	Sweden	1989	Swedish National Dietary Survey (HULK)
7	Denmark	1985	Dietary Habits in Denmark
8[1)]	Denmark	1995	Dietary Habits in Denmark
48	UK	1986-87	National Diet and Nutrition Survey (NDNS)
30	Germany	1985-89	German National Food Intake Survey
31	Germany	1984-85	MONICA Augsburg
37	Netherlands	1987-88	Dutch Nutrition Surveillance System 1987-88
38	Netherlands	1992	Dutch Nutrition Surveillance System 1992
41	Spain	1990	Food Habits in Basque Country 1990
42	Spain	1992-93	Assess. of Nutritional Status of Catalonia's Pop.
43	Spain	1989-90	Food Habits in Navarra's Population
B. Household budget surveys (n = 9)			
49*	UK	1985-89	National Food Survey
1	Belgium	1987-88	DAFNE I
4	Poland	1988	DAFNE I
40	Poland	1996	Polish Household Budget Survey
3	Hungary	1991	DAFNE I
6	Spain	1990-91	DAFNE II
44	Spain	1990-91	Spanish Household Budget Survey
2	Greece	1987-88	DAFNE I
5	Greece	1993-94	DAFNE II
C. Health behaviour surveys (frequency) (n = 11)			
16*	Finland	1986-89	Health Behaviour among Finnish Adult Pop.
20*	Finland	1990-93	Health Behaviour among Finnish Adult Pop.
24*	Finland	1994-97	Health Behaviour among Finnish Adult Pop.
9	Denmark	1986	DAN-MONICA II 1986
10	Denmark	1993	DAN-MONICA II 1993
36	Netherlands	1989	Dutch Health Interview Survey 1989
47	Switzerland	1992-93	Ernährung in der Schweiz
11*	Estonia	1990, 1992	Health Behaviour among Estonian Adult Pop.
13*	Estonia	1994, 1996	Health Behaviour among Estonian Adult Pop.
33*	Lithuania	1994, 1996	Health Behaviour among Lithuanian Adult Pop.
35	Lithuania	1993	CINDI Programme Screening 1993

*results from two or more years combined

[1)] At the very final stages of the project, the figures concerning study no. 8 were found to be slightly incorrect. The new figures, however, did not influence the conclusions drawn on the basis of the study. Those interested in the correct data are advised to contact Margit Groth at the Danish Veterinary and Food Administration.

Tables of results: Disparities in food habits

Fruits, vegetables, fats and oils, meat, dairy, energy-yielding nutrients, meals

a) Studies which have used other SES-measure than education (e.g. occupation, social class) are indicated.
b) Difference:
- ♦♦♦ = statistically significant difference and systematic trend
- ♦♦ = systematic trend
- ♦ = statistically significant difference between low and high education
- NS = not tested or no trend
- — = missing data, no data available

A. CONSUMPTION OF FRUITS BY EDUCATION (g/day or g/10MJ)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
39	Norway	**Men**	**Men**	
		Total 202 g/day	Total 220 g/day	♦♦♦
		Fresh 99	Fresh 107	NS
		Proc. 42	Proc. 39	♦♦
		Juice 62	Juice 74	♦♦♦
		Women	**Women**	
		Total 202 g/day	Total 237 g/day	♦♦♦
		Fresh 120	Fresh 135	♦
		Proc. 31	Proc. 27	NS
		Juice 51	Juice 74	♦♦♦
		Both	**Both**	
		Total 202 g/day	Total 228 g/day	♦♦
		Fresh 111	Fresh 121	NS
		Proc. 36	Proc. 33	NS
		Juice 56	Juice 74	♦♦
28	Finland (4 regions)	**Men** 270 g/day	**Men** 312 g/day	♦♦♦
		Women 284 g/day	**Women** 360 g/day	♦♦♦
45	Sweden	**Men**	**Men**	
		Fresh 108 g/day	Fresh 136 g/day	NS
		Juice 35	Juice 60	♦
		Women	**Women**	
		Fresh 132 g/day	Fresh 149 g/day	NS
		Juice 45	Juice 79	♦
7	Denmark	**Men**	**Men**	
		Fresh 40 g/10 MJ	Fresh 65 g/10 MJ	♦♦♦
		56 g/day	72 g/day	♦♦
		Women	**Women**	
		Fresh 109 g/10 MJ	Fresh 112 g/10 MJ	NS
		89 g/day	93 g/day	♦♦
		Both	**Both**	
		Fresh 82 g/10 MJ	Fresh 84 g/10 MJ	NS
		76 g/day	81 g/day	NS

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
8	Denmark	**Men** 88 g/10 MJ **Women** 204 g/10 MJ	**Men** 188 g/10 MJ **Women** 192 g/10 MJ	♦♦♦ NS
48	UK (England, Scotland, Wales)	a) social class **Men** Fresh 45 g/day Proc. 16 **Women** Fresh 46 g/day Proc. 36	a) social class **Men** Fresh 79 g/day Proc 64 **Women** Fresh 93 g/day Proc. 60	 ♦♦ ♦♦ ♦♦ ♦♦
30	Germany (West incl. West-Berlin)	**NVS** **Men** Fresh 78 g/day Proc. 15 **Women** Fresh 96 g/day Proc. 16 **Both** Fresh 88 g/day Proc. 15 **VERA** **Men** Fresh 90 g/day Proc. 14 **Women** Fresh 117 g/day Proc. 16 **Both** Fresh 106 g/day Proc. 15	**NVS** **Men** Fresh 98 g/day Proc. 18 **Women** Fresh 120 g/day Proc. 18 **Both** Fresh 108 g/day Proc. 18 **VERA** **Men** Fresh 96 g/day Proc. 20 **Women** Fresh 113 g/day Proc. 18 **Both** Fresh 104 g/day Proc. 19	 ♦♦ ♦♦ ♦♦ ♦♦ ♦♦ ♦♦ NS ♦♦ NS ♦♦
31	Germany (Augsburg)	**Men** 70 g/day	**Men** 126 g/day	♦♦♦
37	Netherlands	a) socio-economic status **Men** 119 g/day **Women** 124	a) socio-economic status **Men** 131 g/day **Women** 152	 ♦ ♦
38	Netherlands	**Men** 88 g/10 MJ **Women** 139 g/10 MJ	**Men** 115 g/10 MJ **Women** 215 g/10 MJ	♦ ♦
41	Spain (Basque County)	**Men** 385 g/day **Women** 411 g/day	**Men** 326 g/day **Women** 276 g/day	♦ ♦♦♦
42	Spain (Catalonia)	a) social class 266 g/day	a) social class 272,5 g/day	 NS
43	Spain (Navarra)	**Men** 77 g/day **Women** 110 g/day	**Men** 94 g/day **Women** 121 g/day	♦♦ NS

B. CONSUMPTION OF FRUITS BY EDUCATION (household budget surveys)

Study No.	Country, Region	Low education[a] g/day		High education[a] g/day		Difference[b]
49	UK (England, Scotland, Wales)	a) income group		a) income group		
		Mean	75	**Mean**	179	♦♦
		1985	65	1985	158	♦♦
		1986	71	1986	192	♦♦
		1987	77	1987	182	♦♦
		1988	86	1988	185	♦♦
4	Poland	Total	107	Total	130	NS
		Fresh	101	Fresh	124	NS
		Proc.	6	Proc.	6	NS
40	Poland	Total	105	Total	200	♦♦
		Fresh	99	Fresh	164	♦♦
		Proc.	7	Proc.	36	♦♦
1	Belgium (3 regions)	Total	283	Total	219	NS
		Fresh	251	Fresh	156	NS
		Proc.	31	Proc.	62	♦♦
3	Hungary (19 counties and capital)	Total	171	Total	193	NS
		Fresh	164	Fresh	178	NS
		Proc.	6	Proc.	15	♦♦
6	Spain	Total	332	Total	301	♦♦
		Fresh	312	Fresh	275	♦♦
		Proc.	20	Proc.	25	NS
44	Spain		319		297	NS
2	Greece (9 regions)	Total	344	Total	403	NS
		Fresh	344	Fresh	403	NS
		Proc.	0	Proc.	0	NS
5	Greece	Total	263	Total	315	♦♦
		Fresh	255	Fresh	295	♦♦
		Proc.	8	Proc.	21	♦♦

C. CONSUMPTION OF FRUITS BY EDUCATION (frequency)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
16-19	Finland	Low use of fruit **Men** 48% **Women** 31%	Low use of fruit **Men** 30% **Women** 16%	 ♦♦♦ ♦♦♦
20-23	Finland	Low use of fruit **Men** 50% **Women** 31%	Low use of fruit **Men** 36% **Women** 20%	 ♦♦♦ ♦♦♦
24-27	Finland	Low use of fruit **Men** 49% **Women** 31%	Low use of fruit **Men** 37% **Women** 22%	 ♦♦♦ ♦♦♦
11 & 12	Estonia	Low use of fruit **Men** 92% **Women** 84%	Low use of fruit **Men** 91% **Women** 90%	 NS ♦♦
13 & 14	Estonia	Low use of fruit **Men** 85% **Women** 79%	Low use of fruit **Men** 69% **Women** 58%	 ♦♦♦ ♦♦♦
33 & 34	Lithuania	Low use of fruit **Men** 45% **Women** 42%	Low use of fruit **Men** 24% **Women** 19%	 ♦♦ ♦♦
35	Lithuania (5 rural regions)	Low use of fresh fruit and berries -In summer and autumn **Men** 8% **Women** 5% -In winter and spring **Men** 55% **Women** 52%	Low use of fresh fruit and berries -In summer and autumn **Men** 4% **Women** 0% -In winter and spring **Men** 41% **Women** 43%	 NS ♦♦♦ ♦♦♦ NS
9	Denmark, Copenhagen County	Daily intake **Men** 36% **Women** 53%	Daily intake **Men** 33% **Women** 61%	 NS ♦♦
10	Denmark, Copenhagen County	Daily intake **Men** 27% **Women** 51%	Daily intake **Men** 33% **Women** 63%	 NS NS
36	Netherlands	Persons eating ≥ 5 pieces of fruit a week 63% Persons drinking ≥ 3 glasses of orange juice or grapefruit juice a week 28%	Persons eating ≥ 5 pieces of fruit a week 69% Persons drinking ≥ 3 glasses of orange juice or grapefruit juice a week 44%	♦♦♦ ♦♦♦
47	Switzerland	Daily intake **Men** 58% **Women** 78% **Both** 71%	Daily intake **Men** 63% **Women** 81% **Both** 69%	 ♦♦♦ ♦♦♦ NS

A. CONSUMPTION OF VEGETABLES BY EDUCATION (g/day or g/10 MJ)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
39	Norway	**Men**	**Men**	
		Total 133 g/day	Total 130 g/day	NS
		Fresh 119	Fresh 118	NS
		Proc. 12	Proc. 10	♦♦
		Women	**Women**	
		Total 138 g/day	Total 136 g/day	NS
		Fresh 128	Fresh 128	NS
		Proc. 8	Proc. 6	♦♦
		Both	**Both**	
		Total 136 g/day	Total 133 g/day	NS
		Fresh 124	Fresh 123	NS
		Proc. 10	Proc. 8	♦♦
28	Finland (4 regions)	**Men** 113 g/day	**Men** 142 g/day	♦♦♦
		Women 121 g/day	**Women** 151 g/day	♦♦♦
45	Sweden	**Men**	**Men**	
		Vegetables 65 g/day	Vegetables 91 g/day	♦♦♦
		Root crops 8 g/day	Root crops 10 g/day	NS
		Women	**Women**	
		Vegetables 78 g/day	Vegetables 98 g/day	♦♦♦
		Root crops 10 g/day	Root crops 13 g/day	NS
7	Denmark	**Men** 92 g/10 MJ	**Men** 133 g/10 MJ	♦♦♦
		128 g/day	141 g/day	NS
		Women 147 g/10 MJ	**Women** 161 g/10 MJ	♦
		124 g/day	133 g/day	NS
		Both 125 g/10 MJ	**Both** 145 g/10 MJ	♦♦♦
		125 g/day	138 g/day	♦♦
8	Denmark	**Men** 87 g/10 MJ	**Men** 122 g/10 MJ	♦
		Women 128 g/10 MJ	**Women** 176 g/10 MJ	♦♦♦
48	UK (England, Scotland, Wales)	a) social class	a) social class	
		Men 137 g/day	**Men** 166 g/day	♦♦
		Women 106 g/day	**Women** 142 g/day	♦♦

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
30	Germany (West incl. West-Berlin)	**NVS** **Men** Fresh 108 g/day Proc. 41 **Women** Fresh 105 g/day Proc. 36 **Both** Fresh 106 g/day Proc. 38 **VERA** Men Fresh 112 g/day Proc. 37 **Women** Fresh 110 g/day Proc. 35 **Both** Fresh 111 g/day Proc. 36	**NVS** **Men** Fresh 119 g/day Proc. 39 **Women** Fresh 121 g/day Proc. 35 **Both** Fresh 120 g/day Proc. 37 **VERA** Men Fresh 116 g/day Proc. 41 **Women** Fresh 134 g/day Proc. 34 **Both** Fresh 124 g/day Proc. 38	 ♦♦ NS ♦♦ NS ♦♦ NS NS ♦♦ NS NS NS NS
31	Germany, (Augsburg)	**Men** 164 g/day	**Men** 214 g/day	♦♦♦
37	Netherlands	a) socio-economic status **Men** 158 g/day **Women** 147 g/day	a) socio-economic status **Men** 171 g/day **Women** 159 g/day	 NS NS
38	Netherlands	**Men** 121 g/10 MJ **Women** 173 g/10 MJ	**Men** 146 g/10 MJ **Women** 185 g/10 MJ	♦ ♦
41	Spain (Basque County)	**Men** 163 g/day **Women** 139 g/day	**Men** 184 g/day **Women** 180 g/day	NS ♦♦
42	Spain (Catalonia)	a) social class 207 g/day	a) social class 188 g/day	 ♦♦
43	Spain (Navarra)	**Men** 142 g/day **Women** 136 g/day	**Men** 155 g/day **Women** 141 g/day	♦♦ ♦♦

B. CONSUMPTION OF VEGETABLES BY EDUCATION (household budget surveys)

Study No.	Country, Region	Low education[a] g/day		High education[a] g/day		Difference[b]
49	UK (England, Scotland, Wales)	a) income group		a) income group		
		Mean	170	**Mean**	188	♦♦
		1985	167	1985	175	♦♦
		1986	173	1986	195	♦♦
		1987	165	1987	192	♦♦
		1988	174	1988	192	♦♦
4	Poland	Total	264	Total	198	♦♦
		Fresh	233	Fresh	172	♦♦
		Proc.	31	Proc.	25	NS
40	Poland	Total	210	Total	197	NS
		Fresh	181	Fresh	161	NS
		Proc.	26	Proc.	30	NS
1	Belgium (3 regions)	Total	176	Total	173	NS
		Fresh	142	Fresh	122	NS
		Proc.	34	Proc.	50	♦♦
3	Hungary (19 counties and capital)	Total	246	Total	175	♦♦
		Fresh	232	Fresh	156	♦♦
		Proc.	15	Proc.	19	♦♦
6	Spain	Total	191	Total	174	NS
		Fresh	172	Fresh	145	NS
		Proc.	19	Proc.	29	NS
44	Spain		378[1)]		265[1)]	♦♦♦
2	Greece (9 regions)	Total	290	Total	255	♦
		Fresh	276	Fresh	237	♦♦
		Proc.	14	Proc.	19	♦♦
5	Greece	Total	263	Total	229	♦♦
		Fresh	207	Fresh	186	♦♦
		Poc.	34	Proc.	8	♦♦

[1)] In this figure, potatoes and vegetables are included, which may explain why it is so much higher than the equivalent figure of the Spanish Household Budget Survey (DAFNE II), i.e. study no. 6.

C. CONSUMPTION OF VEGETABLES BY EDUCATION (frequency)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
16-19	Finland	Low use of vegetables **Men** 57% **Women** 43%	Low use of vegetables **Men** 27% **Women** 17%	 ♦♦♦ ♦♦♦
20-23	Finland	Low use of vegetables **Men** 53% **Women** 37%	Low use of vegetables **Men** 24% **Women** 17%	 ♦♦♦ ♦♦♦
24-27	Finland	Low use of vegetables **Men** 54% **Women** 36%	Low use of vegetables **Men** 26% **Women** 17%	 ♦♦♦ ♦♦♦
11 & 12	Estonia	Low use of vegetables **Men** 82% **Women** 73%	Low use of vegetables **Men** 71% **Women** 66%	 ♦ ♦♦
13 & 14	Estonia	Low use of vegetables **Men** 73% **Women** 67%	Low use of vegetables **Men** 61% **Women** 54%	 ♦ ♦
33 & 34	Lithuania	Low use of vegetables **Men** 10% **Women** 9%	Low use of vegetables **Men** 4% **Women** 3%	 ♦♦ ♦♦
35	Lithuania (5 rural regions)	Low use of fresh vegetables -In summer and autumn **Men** 9% **Women** 8% -In winter and spring **Men** 48% **Women** 45% Boiled vegetables **Men** 37% **Women** 27%	Low use of fresh vegetables -In summer and autumn **Men** 6% **Women** 1% -In winter and spring **Men** 37% **Women** 32% Boiled vegetables **Men** 32% **Women** 24%	 NS ♦♦♦ ♦♦ ♦♦♦ NS ♦♦
9	Denmark, Copenhagen County	Daily intake **Men** Raw 11% Boiled 19% **Women** Raw 22% Boiled 38%	Daily intake **Men** Raw 13% Boiled 17% **Women** Raw 27% Boiled 52%	 NS NS NS ♦♦

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
10	Denmark, Copenhagen County	Daily intake **Men** Raw 18% Boiled 21% **Women** Raw 20% Boiled 27%	Daily intake **Men** Raw 16% Boiled 24% **Women** Raw 22% Boiled 47%	 NS NS NS ◆◆
36	Netherlands	Persons eating raw or cooked vegetables every day 47%	Persons eating raw or cooked vegetables every day 62%	◆◆◆
47	Switzerland	Daily consumption **Men** 72% **Women** 84% **Both** 80%	Daily consumption **Men** 84% **Women** 91% **Both** 87%	 ◆◆◆ ◆◆◆ ◆◆◆

A. CONSUMPTION OF FATS AND OILS (ADDED LIPIDS) BY EDUCATION (g/day or g/10MJ)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
39	Norway	**Men**	**Men**	
		Total 39 g/day	Total 40 g/day	NS
		Soft margarine 6.7	Soft margarine 6.8	NS
		Low fat marg. 6.8	Low fat marg. 7.9	NS
		Butter 4.9	Butter 3.3	♦♦
		Oil 0.5	Oil 0.9	♦♦♦
		Women	**Women**	
		Total 27 g/day	Total 24 g/day	NS
		Soft margarine 3.4	Soft margarine 3.1	NS
		Low fat marg. 5.2	Low fat marg. 4.0	NS
		Butter 2.5	Butter 2.2	♦♦
		Oil 0.5	Oil 0.6	♦♦♦
		Both	**Both**	
		Total 32 g/day	Total 32 g/day	NS
		Soft margarine 4.9	Soft margarine 4.9	NS
		Low fat marg. 6	Low fat marg. 5.9	NS
		Butter 3.5	Butter 2.7	♦♦
		Oil 0.5	Oil 0.8	♦♦
28	Finland (4 regions)	**Men**	**Men**	
		Butter 23 g/day	Butter 15 g/day	♦♦♦
		Margarine, oils 26	Margarine, oils 27	NS
		Women	**Women**	
		Butter 13 g/day	Butter 12 g/day	NS
		Margarine, oils 19	Margarine, oils 22	♦♦
45	Sweden	Fats and oils	Fats and oils	
		Men 34 g/day	**Men** 21 g/day	♦♦♦
		Women 16 g/day	**Women** 14 g/day	♦♦

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
7	Denmark	**Men**	**Men**	
		Total 65 g/10 MJ	Total 58 g/10 MJ	♦
		100 g/day	66 g/day	♦♦
		Butter 9 g/10 MJ	Butter 22 g/10 MJ	♦♦♦
		30 g/day	25 g/day	♦♦
		Margarine 39 g/10 MJ	Margarine 29 g/10 MJ	♦♦♦
		58 g/day	33 g/day	♦♦
		Other 7 g/10 MJ	Other 7 g/10 MJ	NS
		12 g/day	8 g/day	NS
		Women	**Women**	
		Total 61 g/10 MJ	Total 53 g/10 MJ	♦♦♦
		57 g/day	45 g/day	♦♦
		Butter 22 g/10 MJ	Butter 24 g/10 MJ	NS
		21 g/day	20 g/day	NS
		Margarine 35 g/10 MJ	Margarine 26 g/10 MJ	♦♦♦
		31 g/day	23 g/day	♦♦
		Other 4 g/10 MJ	Other 3 g/10 MJ	♦
		5 g/day	6 g/day	NS
		Both	**Both**	
		Total 64 g/10 MJ	Total 56 g/10 MJ	♦♦♦
		73 g/day	58 g/day	NS
		Butter 21 g/10 MJ	Butter 23 g/10 MJ	♦
		24 g/day	23 g/day	NS
		Margarine 37 g/10 MJ	Margarine 28 g/10 MJ	♦♦♦
		42 g/day	29 g/day	♦♦
		Other 6 g/10 MJ	Other 5 g/10 MJ	♦
		7 g/day	6 g/day	NS
8	Denmark	**Men**	**Men**	
		Total 51 g/10 MJ	Total 42 g/10 MJ	♦♦
		Oil 3	Oil 5	NS
		Women	**Women**	
		Total 46 g/10 MJ	Total 38 g/10 MJ	NS
		Oil 4	Oil 5	NS

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
48	UK	a) social class	a) social class	
		Men	**Men**	
		Butter 7 g/day	Butter 7.4 g/day	NS
		Polyunsat.marg. 3.1	Polyunsat.marg 6	♦♦
		Low fat spread 2.4	Low fat spread 2.6	NS
		Block margarine 1.7	Block margarine 1.3	♦♦
		Other soft margarine 5.9	Other soft margarine 2.3	♦♦
		Reduced fat spreads 1.7	Reduced fat spreads 0.9	♦♦
		Other spreads & fats 0.1	Other spreads & fats 0.1	NS
		Women	**Women**	
		Butter 5.6	Butter 6.4	♦♦
		Polyunsat.marg. 1.6	Polyunsat.marg. 4.3	♦♦
		Low fat spread 2	Low fat spread 1.9	NS
		Block margarine 1.3	Block margarine 1	NS
		Other soft margarine 2.9	Other soft margarine 1.1	♦♦
		Reduced fat spreads 1.4	Reduced fat spreads 0.6	♦♦
		Other spreads & fats 0.1	Other spreads & fats 0.1	NS
30	Germany (West incl. West-Berlin)	**NVS**	**NVS**	
		Men	**Men**	
		Lipids, animal 23 g/day	Lipids, animal 24 g/day	NS
		Lipids, veget. 23	Lipids, veget. 18	♦♦
		Women	**Women**	
		Lipids, animal 19 g/day	Lipids, animal 19 g/day	NS
		Lipids, veget. 18	Lipids, veget. 15	♦♦
		Both	**Both**	
		Lipids, animal 21 g/day	Lipids, animal 22 g/day	NS
		Lipids, veget. 20	Lipids, veget. 17	♦♦
		VERA	**VERA**	
		Men	**Men**	
		Lipids, animal 20 g/day	Lipids, animal 23 g/day	NS
		Lipids, veget. 24	Lipids, veget. 20	♦♦
		Women	**Women**	
		Lipids, animal 19 g/day	Lipids, animal 17 g/day	♦♦
		Lipids, veget. 17	Lipids, veget. 15	♦♦
		Both	**Both**	
		Lipids, animal 19 g/day	Lipids, animal 20 g/day	NS
		Lipids, veget. 20	Lipids, veget. 18	NS
31	Germany (Augsburg)	**Men**	**Men**	
		Butter 17 g/day	Butter 18 g/day	NS
		Other 17	Other 20	NS
37	Netherlands	a) socio-economic status	a) socio-economic status	
		Edible fats	Edible fats	
		Men 63 g/day	**Men** 53 g/day	♦
		Women 43 g/day	**Women** 40 g/day	NS

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
38	Netherlands	Spreading, cooking fats **Men** 39 g/10 MJ **Women** 35 g/10MJ	Spreading, cooking fats **Men** 32 g/10 MJ **Women** 27 g/10 MJ	 ♦ ♦
41	Spain (Basque County)	**Men** Total 46 g/day Lipids, animal 3.4 Lipids, veget. 43 **Women** Total 45 g/day Lipids, animal 1.4 Lipids, veget. 44	**Men** Total 46 g/day Lipids, animal 3.6 Lipids, veget. 42 **Women** Total 45 g/day Lipids, animal 5.3 Lipids, veget. 40	 NS ♦ ♦ NS ♦♦♦ ♦♦♦
42	Spain (Catalonia)	a) social class 29 g/day	a) social class 29 g/day	 NS
43	Spain (Navarra)	**Men** 18 g/day **Women** 14 g/day	**Men** 18 g/day **Women** 16 g/day	NS ♦♦♦

B. CONSUMPTION OF FATS AND OILS (ADDED LIPIDS) BY EDUCATION (household budget surveys)

Study No.	Country, Region	Low education[a] g/day		High education[a] g/day		Difference[b]
49	UK (England, Scotland, Wales)	a) income group		a) income group		
		Mean		**Mean**		
		Total	38.8	Total	34.8	♦♦
		Butter	7	Butter	9.8	♦♦
		Margarine	17.6	Margarine	11.8	♦♦
		Lard etc.	6.5	Lard etc.	2.1	♦♦
		Other fats	8.6	Other fats	11	NS
		1985		**1985**		
		Total	37.9	Total	35.0	♦♦
		Butter	7.7	Butter	12.4	♦♦
		Margarine	17	Margarine	10.9	♦♦
		Lard etc.	7	Lard etc.	2.4	♦♦
		Other fats	6.3	Other fats	9.3	♦♦
		1986		**1986**		
		Total	39.6	Total	35.2	♦♦
		Butter	6.3	Butter	9.9	♦♦
		Margarine	18.3	Margarine	11.4	♦♦
		Lard etc.	7.6	Lard etc.	2.0	♦♦
		Other fats	7.4	Other fats	11.8	♦♦
		1987		**1987**		
		Total	39.2	Total	35.8	♦♦
		Butter	6.5	Butter	9.0	♦♦
		Margarine	17.8	Margarine	13.9	♦♦
		Lard etc.	6.4	Lard etc.	2.7	♦♦
		Other fats	8.4	Other fats	10.2	NS
		1988		**1988**		
		Total	38.5	Total	33.2	♦♦
		Butter	7.5	Butter	8.0	NS
		Margarine	17.3	Margarine	11	♦♦
		Lard etc.	5	Lard etc.	1.5	♦♦
		Other fats	8.7	Other fats	12.7	♦♦
4	Poland	Total	78	Total	50	♦♦
		Butter	27	Butter	27	NS
		Animfat	31	Animfat	8.1	♦♦
		Vegeoil	6.6	Vegeoil	4.8	♦♦
		Vegefat	14	Vegefat	10	♦♦
40	Poland	Edibfat	61	Edibfat	47	♦♦
		Butter	10	Butter	14	♦♦
		Animfat	15	Animfat	5	♦♦
		Vegefat	37	Vegefat	27	♦♦
1	Belgium (3 regions)	Total	46	Total	36	♦♦
		Butter	8.3	Butter	11	♦♦
		Animfat	0.7	Animfat	0.9	NS
		Vegeoil	15	Vegeoil	8.3	NS
		Vegefat	22	Vegefat	16	♦♦

Study No.	Country, Region	Low education[a] g/day		High education[a] g/day		Difference[b]
3	Hungary (19 counties and capital)	Total	68	Total	42	♦♦
		Butter	3.7	Butter	4.3	NS
		Animfat	40	Animfat	14	♦♦
		Vegeoil	17	Vegeoil	14	NS
		Vegefat	7.3	Vegefat	10	NS
6	Spain	Total lipids	70	Total lipids	52	NS
		Butter	0.7	Butter	1.5	♦♦
		Animfat	0.3	Animfat	0.4	NS
		Vegeoil	74	Vegeoil	53	♦♦
		Vegefat	1.8	Vegefat	2.5	NS
44	Spain	Fats and oils	64	Fats and oils	46	♦♦
		Lipids, animal	0.7	Lipids, animal	1.4	♦♦
		Lipids, veget.	64	Lipids, veget.	44	♦♦
2	Greece (9 regions)	Total lipids	105	Total lipids	69	♦♦
		Butter	2.9	Butter	1.6	NS
		Animfat	0.0	Animfat	0.1	NS
		Vegeoil	96	Vegeoil	61	♦♦
		Vegefat	5.3	Vegefat	6.3	NS
5	Greece	Total lipids	83	Total lipids	55	♦♦
		Butter	0.9	Butter	0.9	NS
		Animfat	0	Animfat	0	NS
		Vegeoil	85	Vegeoil	54	♦♦
		Vegefat	5.1	Vegefat	5.4	NS

C. CONSUMPTION OF FATS AND OILS (ADDED LIPIDS) BY EDUCATION (frequency)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
16-19	Finland	ANIMAL FAT On bread **Men** 61% **Women** 55% In cooking **Men** 77% **Women** 75%	ANIMAL FAT On bread **Men** 46% **Women** 45% In cooking **Men** 63% **Women** 66%	 ♦♦♦ ♦♦♦ ♦♦♦ ♦♦♦
20-23	Finland	ANIMAL FAT On bread **Men** 38% **Women** 32% In cooking **Men** 55% **Women** 59%	ANIMAL FAT On bread **Men** 23% **Women** 23% In cooking **Men** 38% **Women** 43%	 ♦♦♦ ♦♦♦ ♦♦♦ ♦♦♦
24-27	Finland	ANIMAL FAT On bread **Men** 30% **Women** 26% In cooking **Men** 48% **Women** 53%	ANIMAL FAT On bread **Men** 21% **Women** 19% In cooking **Men** 31% **Women** 33%	 ♦♦♦ ♦♦♦ ♦♦♦ ♦♦♦
11 & 12	Estonia			—
13 & 14	Estonia	ANIMAL FAT On bread **Men** 72% **Women** 75% In cooking **Men** 35% **Women** 26%	ANIMAL FAT On bread **Men** 65% **Women** 61% In cooking **Men** 18% **Women** 14%	 NS ♦♦♦ ♦♦♦ ♦♦♦

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
33 & 34	Lithuania	FOOD PREPARATION	FOOD PREPARATION	
		Men	**Men**	
		Butter 51%	Butter 36%	♦♦
		Oil 31%	Oil 49%	♦♦
		Other 18%	Other 15%	NS
		Women	**Women**	
		Butter 41%	Butter 21%	♦♦
		Oil 37%	Oil 67%	♦♦
		Other 22%	Other 12%	♦♦
		ON BREAD	ON BREAD	
		Men	**Men**	
		Butter 67%	Butter 65%	NS
		Margarine 26%	Margarine 26%	NS
		Other 7%	Other 9%	♦♦
		Women	**Women**	
		Butter 64%	Butter 60%	NS
		Margarine 29%	Margarine 31%	NS
		Other 7%	Other 9%	NS
35	Lithuania (5 rural regions)	Use of vegetable oil for cooking	Use of vegetable oil for cooking	
		Men 11%	**Men** 16%	♦♦
		Women 21%	**Women** 35%	♦
9	Denmark, Copenhagen County	Daily intake	Daily intake	
		Men	**Men**	
		Butter, lard, margarine 79%	Butter, lard, margarine 67%	NS
		Vegetable margarine 70%	Vegetable margarine 64%	NS
		Women	**Women**	
		Butter, lard, Margarine 77%	Butter, lard, Margarine 79%	NS
		Vegetable Margarine 61%	Vegetable Margarine 57%	NS
10	Denmark, Copenhagen County	Daily intake	Daily intake	
		Men	**Men**	
		Butter, lard, margarine 73%	Butter, lard, margarine 62%	♦♦
		Vegetable margarine 55%	Vegetable margarine 36%	♦♦
		Women	**Women**	
		Butter, lard, Margarine 65%	Butter, lard, Margarine 72%	NS
		Vegetable Margarine 39%	Vegetable Margarine 34%	NS

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
36	Netherlands	Persons mostly using margarine, butter or frying fat to roast or fry food 84% Persons mostly using low-fat margarine or diet margarine on bread 55%	Persons mostly using margarine, butter or frying fat to roast or fry food 71% Persons mostly using low-fat margarine or diet margarine on bread 59%	♦ NS
47	Switzerland			–

A. CONSUMPTION OF MEAT BY EDUCATION (g/day or g/10MJ)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
39	Norway	**Men** 124 g/day	**Men** 120 g/day	NS
		Women 89 g/day	**Women** 81 g/day	♦
		Both 104 g/day	**Both** 100 g/day	NS
28	Finland (4 regions)	**Men**	**Men**	
		Total 171 g/day	Total 158 g/day	NS
		Meat 88	Meat 103	♦♦
		Meat prod. 83	Meat prod. 55	♦♦
		Women	**Women**	
		Total 106 g/day	Total 101 g/day	♦♦
		Meat 69	Meat 68	NS
		Meat prod. 37	Meat prod. 33	NS
45	Sweden	**Men**	**Men**	
		Meat 94 g/day	Meat 97 g/day	NS
		Sausage 31	Sausage 24	♦
		Women	**Women**	
		Meat 72 g/day	Meat 73 g/day	NS
		Sausage 20	Sausage 15	♦♦♦
7	Denmark	**Men** 116 g/10 MJ	**Men** 111 g/10 MJ	NS
		165 g/day	120 g/day	♦♦
		Women 101 g/10 MJ	**Women** 96 g/10 MJ	NS
		87 g/day	82 g/day	NS
		Both 107 g/10 MJ	**Both** 105 g/10 MJ	NS
		118 g/day	104 g/day	NS
8	Denmark	**Men**	**Men**	
		Total 145 g/10 MJ	Total 108 g/10 MJ	♦♦
		Poultry 15	Poultry 21	♦♦
		Women	**Women**	
		Total 115 g/10 MJ	Total 96 g/10 MJ	NS
		Poultry 22	Poultry 14	NS

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
48	UK (England, Scotland, Wales)	a) social class **Men** Total 173 g/day Bacon, ham 19.6 Beef, veal 37.9 Lamb 13.6 Pork 11.7 Coated chicken 3 Chicken, turkey 24.6 Sausages 15.7 **Women** Total 119 g/day Bacon, ham 11.9 Beef, veal 25.6 Lamb 8.1 Pork 7.3 Coated chicken 1.6 Chicken, turkey 16.1 Sausages 9.6	a) social class **Men** Total 180 g/day Bacon, ham 18.3 Beef, veal 47.1 Lamb 8.4 Pork 11 Coated chicken 2.3 Chicken, turkey 26.4 Sausages 12.3 **Women** Total 118 g/day Bacon, ham 10.9 Beef, veal 33.4 Lamb 7.1 Pork 6.9 Coated chicken 1.4 Chicken, turkey 22.9 Sausages 6.4	 ♦♦ NS ♦♦ ♦♦ NS ♦♦ ♦♦ NS NS NS ♦♦ NS NS NS ♦♦ ♦♦
30	Germany (West incl. West-Berlin)	**NVS** **Men** 212 g/day **Women** 143 g/day **Both** 174 g/day **VERA** **Men** 202 g/day **Women** 133 g/day **Both** 160 g/day	**NVS** **Men** 168 g/day **Women** 107 g/day **Both** 141 g/day **VERA** **Men** 154 g/day **Women** 100 g/day **Both** 131 g/day	 ♦♦ ♦♦ ♦♦ ♦♦ ♦♦ ♦♦
31	Germany (Augsburg)	**Men** Total 249 g/day Meat 125 Meat prod. 124	**Men** Total 200 g/day Meat 104 Meat prod. 96	 ♦♦♦ ♦♦♦
37	Netherlands	a) socio-economic status **Men** 153 g/day **Women** 116 g/day	a) socio-economic status **Men** 126 g/day **Women** 97 g/day	 ♦ ♦
38	Netherlands	Meat/Fish/Eggs **Men** 159 g/10 MJ **Women** 175 g/10 MJ	Meat/Fish/Eggs **Men** 145 g/10 MJ **Women** 128 g/10 MJ	 ♦ ♦
41	Spain (Basque County)	**Men** 191 g/day **Women** 109 g/day	**Men** 169 g/day **Women** 126 g/day	NS NS
42	Spain (Catalonia)	a) social class Total 56 g/day	a) social class Total 56 g/day	 NS
43	Spain (Navarra)	**Men** 78 g/day **Women** 49 g/day	**Men** 64 g/day **Women** 41 g/day	♦♦♦ ♦

B. CONSUMPTION OF MEAT BY EDUCATION (household budget surveys)

Study No.	Country, Region	Low education[a] g/day	High education[a] g/day	Difference[b]
49	UK (England, Scotland, Wales)	a) income group	a) income group	
		Mean	**Mean**	
		Total 142	Total 138	NS
		Beef, veal 23	Beef, veal 28.4	
		Mutton, lamb 10.4	Mutton, lamb 12.4	
		Pork 11.9	Pork 13.4	
		Total carcase meat 45.5	Total carcase meat 54.2	
		Bacon, ham 13.7	Bacon, ham 12.3	
		Poultry 24.9	Poultry 31.3	
		Other, meat prod. 58.1	Other, meat prod. 40.6	
		1985	**1985**	
		Total 136	Total 142	♦♦
		Beef, veal 20	Beef, veal 30.9	♦♦
		Mutton, lamb 10.2	Mutton, lamb 15.9	♦♦
		Pork 12.2	Pork 15.9	♦♦
		Total carcase meat 43.3	Total carcase meat 62.6	♦♦
		Bacon, ham 14.2	Bacon, ham 11.1	♦♦
		Poultry 22	Poultry 28.4	♦♦
		Other, meat prod. 57.7	Other, meat prod. 40.3	♦♦
		1986	**1986**	
		Total 145	Total 135	♦♦
		Beef, veal 22.5	Beef, veal 27.5	♦♦
		Mutton, lamb 10.8	Mutton, lamb 11.6	♦♦
		Pork 13.3	Pork 12.3	NS
		Total carcase meat 46.5	Total carcase meat 51.4	NS
		Bacon, ham 14.3	Bacon, ham 15.2	♦♦
		Poultry 24.5	Poultry 29.9	♦♦
		Other, meat prod. 59.3	Other, meat prod. 38.9	♦♦
		1987	**1987**	
		Total 140	Total 147	♦♦
		Beef, veal 24.6	Beef, veal 32	♦♦
		Mutton, lamb 8.3	Mutton, lamb 13.6	♦♦
		Pork 11.5	Pork 12.6	NS
		Total carcase meat 44.3	Total carcase meat 58.2	♦♦
		Bacon, ham 13.4	Bacon, ham 12.7	♦♦
		Poultry 23.7	Poultry 34.3	♦♦
		Other, meat prod. 58.6	Other, meat prod. 41.8	♦♦
		1988	**1988**	
		Total 147	Total 129	♦♦
		Beef, veal 24.7	Beef, veal 23.4	NS
		Mutton, lamb 12.5	Mutton, lamb 8.4	♦♦
		Pork 10.7	Pork 12.6	NS
		Total carcase meat 47.9	Total carcase meat 44.4	NS
		Bacon, ham 13	Bacon, ham 10.2	♦♦
		Poultry 29.3	Poultry 32.7	♦♦
		Other, meat prod. 56.7	Other, meat prod. 41.3	♦♦

Study No.	Country, Region	Low education[a)]		High education[a)]		Difference[b)]
4	Poland	Total	219	Total	168	♦♦
		Pork	53	Pork	35	♦♦
		Beef, veal, calf	19	Beef, veal, calf	22	NS
		Other red meat	3.1	Other red meat	1.4	NS
		Poultry	43	Poultry	23	♦♦
		Offals	4.7	Offals	4.5	–
		Meat products	96	Meat products	82	♦♦
40	Poland	Total	102	Total	87	♦♦
		Pork	41	Pork	32	♦♦
		Beef	10	Beef	17	♦♦
		Veal	1	Veal	3	♦♦
		Poultry	43	Poultry	36	♦♦
		Other	7	Other	3	♦♦
		Offals	5	Offals	5	NS
		Meat prod	83	Meat prod	71	♦♦
1	Belgium (3 regions)	Total	164	Total	148	NS
		Pork	30	Pork	25	NS
		Beef, veal, calf	40	Beef, veal, calf	35	NS
		Other red meat	13	Other red meat	7.6	NS
		Poultry	23	Poultry	19	NS
		Offals	3.6	Offals	4.1	NS
		Meat products	45	Meat products	39	NS
		Meat dishes	9.3	Meat dishes	18	♦♦
3	Hungary (19 counties and capital)	Total	219	Total	164	♦♦
		Pork	61	Pork	47	♦♦
		Beef, veal, calf	3.0	Beef, veal, calf	5.7	♦♦
		Other red meat	2.4	Other red meat	2.2	NS
		Poultry	76	Poultry	36	♦♦
		Offals	10	Offals	8.1	NS
		Meat products	66	Meat products	62	NS
		Meat dishes	0.7	Meat dishes	2.6	♦♦
6	Spain	Total	184	Total	149	NS
		Pork	29	Pork	15	NS
		Beaf, veal, calf	23	Beaf, veal, calf	37	♦♦
		Other red meat	16	Other red meat	12	NS
		Poultry	68	Poultry	44	♦♦
		Offals	1.6	Offals	1.6	NS
		Meat products	43	Meat products	36	NS
		Meat dishes	3.5	Meat dishes	3.8	NS
44	Spain	Total	196	Total	158	♦♦
2	Greece (9 regions)	Total	168	Total	178	NS
		Pork	19	Pork	17	NS
		Beef, veal, calf	57	Beef, veal, calf	78	♦♦
		Other red meat	32	Other red meat	15	♦♦
		Poultry	38	Poultry	33	NS
		Offals	4.9	Offals	6.1	NS
		Meat products	8.9	Meat products	16	♦♦
		Meat dishes	9.4	Meat dishes	13	NS

Study No.	Country, Region	Low education[a)]		High education[a)]		Difference[b)]
5	Greece	Total	157	Total	144	♦♦
		Pork	14	Pork	13	NS
		Beef, veal, calf	51	Beef, veal, calf	58	♦♦
		Other red meat	30	Other red meat	13	♦♦
		Poultry	38	Poultry	33	NS
		Offals	4.9	Offals	3	♦♦
		Meat products	18	Meat products	24	NS

C. CONSUMPTION OF MEAT BY EDUCATION (frequency)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
16-19	Finland			—
20-23	Finland			—
24-27	Finland			—
11 & 12	Estonia			—
13 & 14	Estonia			—
33 & 34	Lithuania			—
35	Lithuania (5 rural regions)	Low use of **Men** Fatty meat 49% Poultry 79% **Women** Fatty meat 64% Poultry 79%	Low use of **Men** Fatty meat 61% Poultry 87% **Women** Fatty meat 69% Poultry 90%	 ♦ ♦♦ ♦♦ ♦♦
9	Denmark, Copenhagen County			—
10	Denmark, Copenhagen County			—
36	Netherlands			—
47	Switzerland	Daily consumption **Men** 32% **Women** 23% **Both** 26%	Daily consumption **Men** 28% **Women** 13% **Both** 23%	 NS ♦♦ ♦♦♦

A. CONSUMPTION OF DAIRY PRODUCE BY EDUCATION (g/day or g/10MJ)

Study No.	Country, Region	Low education[a)]		High education[a)]		Difference[b)]
39	Norway	**Men**		**Men**		
		Total	639 g/day	Total	632 g/day	NS
		Milk, yogurt	548	Milk, yogurt	538	NS
		Cheese	36	Cheese	35	NS
		Women		**Women**		
		Total	474 g/day	Total	485 g/day	NS
		Milk, yogurt	394	Milk, yogurt	408	NS
		Cheese	27	Cheese	33	♦♦♦
		Both		**Both**		
		Total	546 g/day	Total	558 g/day	NS
		Milk, yogurt	462	Milk, yogurt	472	NS
		Cheese	31	Cheese	34	♦♦
28	Finland (4 regions)	**Men**		**Men**		
		Milk	605 g/day	Milk	482 g/day	♦♦♦
		Cheese	29	Cheese	36	♦♦♦
		Women		**Women**		
		Milk	418 g/day	Milk	361 g/day	♦♦♦
		Cheese	33	Cheese	40	♦♦♦
45	Sweden	**Men**		**Men**		
		Milk	439 g/day	Milk	370 g/day	♦♦♦
		Cheese	40	Cheese	44	NS
		Women		**Women**		
		Milk	333 g/day	Milk	307 g/day	NS
		Cheese	34	Cheese	44	♦♦♦

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
7	Denmark	**Men**	**Men**	
		Total 323 g/10 MJ	Total 371 g/10 MJ	NS
		Full fat milk 140	Full fat milk 78	♦♦♦
		Low fat milk 112	Low fat milk 138	NS
		Skim milk 32	Skim milk 96	♦♦♦
		Sour milk products 27	Sour milk products 49	♦♦♦
		Cheese 37	Cheese 50	♦♦♦
		Women	**Women**	
		Total 370	Total 359	NS
		Full fat milk 106	Full fat milk 70	♦♦♦
		Low fat milk 121	Low fat milk 123	NS
		Skim milk 79	Skim milk 80	NS
		Sour milk products 50	Sour milk products 78	♦♦♦
		Cheese 47	Cheese 65	♦♦♦
		Both	**Both**	
		Total 351	Total 366	NS
		Full fat milk 119	Full fat milk 75	♦♦♦
		Low fat milk 117	Low fat milk 132	NS
		Skim milk 60	Skim milk 89	♦♦
		Sour milk products 41	Sour milk products 60	♦♦♦
		Cheese 43	Cheese 56	♦♦♦
		Men	**Men**	
		Total 482 g/day	Total 408 g/day	♦♦
		Full fat milk 225	Full fat milk 92	♦♦
		Low fat milk 153	Low fat milk 148	NS
		Skim milk 48	Skim milk 103	♦♦
		Sour milk products 38	Sour milk products 52	NS
		Cheese 55	Cheese 55	NS
		Women	**Women**	
		Total 339	Total 309	NS
		Full fat milk 102	Full fat milk 61	♦♦
		Low fat milk 111	Low fat milk 113	NS
		Skim milk 68	Skim milk 62	NS
		Sour milk products 41	Sour milk products 65	♦♦
		Cheese 44	Cheese 56	♦♦
		Both	**Both**	
		Total 395	Total 368	♦♦
		Full fat milk 151	Full fat milk 80	♦♦
		Low fat milk 128	Low fat milk 134	NS
		Skim milk 60	Skim milk 87	♦♦
		Sour milk products 40	Sour milk products 57	♦♦
		Cheese 48	Cheese 55	♦♦

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
8	Denmark	**Men**	**Men**	
		Wholefat milk 62g/10MJ	Wholefat milk 37g/10MJ	♦♦
		Low fat milk 22	Low fat milk 39	NS
		Cheese 33	Cheese 29	♦♦
		Women	**Women**	
		Whole fat milk 57	Whole fat milk 42	NS
		Low fat milk 28	Low fat milk 65	♦♦
		Cheese 37	Cheese 44	NS
48	UK (England, Scotland, Wales)	a) social class	a) social class	
		Men	**Men**	
		Whole milk 193 g/day	Whole milk 177 g/day	♦♦
		Semi-skimmed milk 26	Semi-skimmed milk 55	♦♦
		Skimmed milk 8	Skimmed milk 36	♦♦
		Cheese 15	Cheese 21	♦♦
		Women	**Women**	
		Whole milk 156	Whole milk 136	NS
		Semi-skimmed milk 25	Semi-skimmed milk 47	♦♦
		Skimmed milk 19	Skimmed milk 35	♦♦
		Cheese 11	Cheese 18	♦♦
30	Germany (West incl. West-Berlin)	**NVS**	**NVS**	
		Men	**Men**	
		Milk and other dairy products 145 g/day	Milk and other dairy products 201 g/day	♦♦
		Cheese 36	Cheese 50	♦♦
		Women	**Women**	
		Milk and other dairy products 132 g/day	Milk and other dairy products 182 g/day	♦♦
		Cheese 35	Cheese 49	♦♦
		Both	**Both**	
		Milk and other dairy products 138 g/day	Milk and other dairy products 193 g/day	♦♦
		Cheese 35	Cheese 50	♦♦
		VERA	**VERA**	
		Men	**Men**	
		Milk and other dairy products 162 g/day	Milk and other dairy products 229 g/day	♦♦
		Cheese 35	Cheese 58	♦♦
		Women	**Women**	
		Milk and other dairy products 150 g/day	Milk and other dairy products 194 g/day	♦♦
		Cheese 37	Cheese 53	♦♦
		Both	**Both**	
		Milk and other dairy products 154 g/day	Milk and other dairy products 214 g/day	♦♦
		Cheese 36	Cheese 56	♦♦

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
31	Germany (Augsburg)	**Men**	**Men**	
		Milk and Milk products 124 g/day	Milk and Milk products 129 g/day	NS
		Cheese 25	Cheese 39	♦♦♦
37	Netherlands	a) socio-economic status	a) socio-economic status	
		Men	**Men**	
		Milk products 342 g/day	Milk products 370 g/day	NS
		Cheese 34	Cheese 43	♦
		Women	**Women**	
		Milk products 301 g/day	Milk products 336 g/day	NS
		Cheese 28	Cheese 37	♦
38	Netherlands	**Men**	**Men**	
		Milk (prod.) 263 g/10 MJ	Milk (prod.) 321 g/10 MJ	♦
		Cheese 31	Cheese 35	♦
		Women	**Women**	
		Milk (prod.) 345 g/10 MJ	Milk (prod.) 343 g/10 MJ	NS
		Cheese 33	Cheese 45	♦
41	Spain (Basque County)	**Men**	**Men**	
		Total 281 g/day	Total 414 g/day	♦♦♦
		Milk/sour milk 254	Milk/sour milk 353	♦♦
		Cheese 11	Cheese 26	♦♦
		Women	**Women**	
		Total 353 g/day	Total 376 g/day	♦
		Milk/sour milk 320	Milk/sour milk 331	NS
		Cheese 12	Cheese 24	♦♦
42	Spain (Catalonia)	a) social class	a) social class	
		Total 132 g/day	Total 124 g/day	♦
43	Spain (Navarra)	**Men**	**Men**	
		Total 113 g/day	Total 144 g/day	♦♦
		Milk/sour milk 102	Milk/sour milk 132	♦♦♦
		Cheese 4	Cheese 5	♦♦
		Women	**Women**	
		Total 136 g/day	Total 146 g/day	NS
		Milk/sour milk 122	Milk/sour milk 136	NS
		Cheese 3	Cheese 5	♦♦

B. CONSUMPTION OF DAIRY PRODUCE BY EDUCATION
(household budget surveys)

Study No.	Country, Region	Low education[a] g/day	High education[a] g/day	Difference[b]
49	UK (England, Scotland, Wales)	a) income group	a) income group	
		Mean	**Mean**	
		Milk, cream 0.31 l/day	Milk, cream 0.32 l/day	NS
		Cheese 13.7	Cheese 19.5	♦♦
		1985	**1985**	
		Milk, cream 0.31 l/day	Milk, cream 0.34 l/day	♦♦
		Cheese 13	Cheese 18	♦♦
		1986	**1986**	
		Milk, cream 0.30	Milk, cream 0.33	♦♦
		Cheese 13.1	Cheese 21	♦♦
		1987	**1987**	
		Milk, cream 0.33	Milk, cream 0.32	NS
		Cheese 14.6	Cheese 20	♦♦
		1988	**1988**	
		Milk, cream 0.31	Milk, cream 0.31	NS
		Cheese 14	Cheese 19	♦♦
4	Poland	Milk 482	Milk 273	♦♦
		Cheese 48	Cheese 53	NS
		Other dairy 36	Other dairy 22	♦♦
40	Poland	Milk 276	Milk 205	♦♦
		Cheese 24	Cheese 39	♦♦
1	Belgium (3 regions)	Milk 174	Milk 153	NS
		Cheese 36	Cheese 47	♦♦
		Other dairy 35	Other dairy 54	♦♦
3	Hungary (19 counties and capital)	Milk 295	Milk 244	NS
		Cheese 7.6	Cheese 18	♦♦
		Other dairy 47	Other dairy 58	NS
6	Spain	Milk 362	Milk 332	♦♦
		Cheese 18	Cheese 24	NS
		Other dairy 34	Other dairy 42	♦♦
44	Spain	Total 373	Total 360	NS
		Milk/sour milk 322	Milk/sour milk 294	♦♦
		Cheese 15	Cheese 20	♦♦♦
2	Greece (9 regions)	Milk 192	Milk 251	♦♦
		Cheese 50	Cheese 68	♦♦
		Other dairy 24	Other dairy 45	♦♦
5	Greece	Milk 176	Milk 215	♦♦
		Cheese 42	Cheese 48	NS
		Other dairy 14	Other dairy 29	♦♦

C. CONSUMPTION OF DAIRY PRODUCE BY EDUCATION (frequency)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
16-19	Finland	Use of high fat milk **Men** 38% **Women** 26%	Use of high fat milk **Men** 13% **Women** 7%	 ♦♦♦ ♦♦♦
20-23	Finland	Use of high fat milk **Men** 26% **Women** 17%	Use of high fat milk **Men** 8% **Women** 4%	 ♦♦♦ ♦♦♦
24-27	Finland	Use of high fat milk **Men** 22% **Women** 11%	Use of high fat milk **Men** 6% **Women** 4%	 ♦♦♦ ♦♦♦
11 & 12	Estonia			—
13 & 14	Estonia	Use of high fat milk **Men** 74% **Women** 80%	Use of high fat milk **Men** 78% **Women** 72%	 ♦♦ ♦
33 & 34	Lithuania			—
35	Lithuania (5 rural regions)	Low use of **Men** Milk 58% Sour milk 74% **Women** Milk 58% Sour milk 80%	Low use of **Men** Milk 46% Sour milk 65% **Women** Milk 61% Sour milk 84%	 ♦♦♦ ♦♦ NS NS
9	Denmark, Copenhagen County			—
10	Denmark, Copenhagen County			—
36	Netherlands	Persons mostly using whole milk 35% Persons consuming ≥ 2 glasses/bowls of milk and milk products a day 41 %	Persons mostly using whole milk 17% Persons consuming ≥ 2 glasses/bowls of milk and milk products a day 53 %	 ♦♦♦ ♦♦♦
47	Switzerland	Daily consumption of milk **Men** 48% **Women** 40% **Both** 43%	Daily consumption of milk **Men** 38% **Women** 40% **Both** 39%	 ♦♦♦ NS ♦♦♦

A. CONSUMPTION OF ENERGY-YIELDING NUTRIENTS BY EDUCATION (g/day or g/10MJ)

Study No.	Country, Region	Low education[a)]		High education[a)]		Difference[b)]
39	Norway	**Men**		**Men**		
		Fat	30.7 E%	Fat	30.1 E%	NS
		Saturated fat	12.7	Saturated fat	12.0	NS
		Carbohydrates	52.5	Carbohydrates	51.8	NS
		Sugar	8.5	Sugar	8	NS
		Protein	15.5	Protein	15.6	NS
		Alcohol	1.3	Alcohol	2.4	♦♦♦
		Women		**Women**		
		Fat	30.2 E%	Fat	28.7 E%	♦
		Saturated fat	12.6	Saturated fat	12	♦♦♦
		Carbohydrates	53.4	Carbohydrates	54.2	NS
		Sugar	8.7	Sugar	8	♦♦
		Protein	15.8	Protein	15.8	NS
		Alcohol	0.7	Alcohol	1.2	♦♦♦
		Total		**Total**		
		Fat	30.4 E%	Fat	29.4 E%	NS
		Saturated fat	12.6	Saturated fat	12.0	♦♦
		Carbohydrates	53	Carbohydrates	53.1	NS
		Sugar	8.6	Sugar	8	NS
		Protein	15.7	Protein	15.7	NS
		Alcohol	1	Alcohol	1.8	♦♦
28	Finland (4 regions)	**Men**		**Men**		
		Fat	35 E%	Fat	34 E%	NS
		Saturated fat	16	Saturated fat	15	NS
		Carbohydrate	46	Carbohydrate	46	NS
		Sugar	9.5	Sugar	9.5	NS
		Protein	16	Protein	16	NS
		Alcohol	2.8	Alcohol	3.7	NS
		Energy	10.4 MJ	Energy	9.6 MJ	♦♦♦
		Women		**Women**		
		Fat	34 E%	Fat	34 E%	NS
		Saturated fat	16	Saturated fat	15	NS
		Carbohydrate	49	Carbohydrate	49	NS
		Sugar	10	Sugar	12	NS
		Protein	16	Protein	16	NS
		Alcohol	0.9	Alcohol	1.4	NS
		Energy	7.4 MJ	Energy	7.6 MJ	NS

Study No.	Country, Region	Low education[a)]		High education[a)]		Difference[b)]
45	Sweden	**Men**		**Men**		
		Fat	37 E%	Fat	35 E%	NS
		Saturated fat	17	Saturated fat	16	NS
		Carbohydrates	46	Carbohydrates	45	NS
		Sugar	8	Sugar	7	NS
		Protein	15	Protein	15	NS
		Alcohol	2.2	Alcohol	4.2	◆◆
		Energy	9.7 MJ	Energy	9.5 MJ	NS
		Women		**Women**		
		Fat	35 E%	Fat	36 E%	NS
		Saturated fat	16	Saturated fat	16	NS
		Carbohydrates	48	Carbohydrates	49	◆◆
		Sugar	9	Sugar	10	◆◆
		Protein	15	Protein	14	NS
		Alcohol	1.4	Alcohol	2.4	◆◆
		Energy	7.3 MJ	Energy	7.9 MJ	◆◆
7	Denmark	**Men**		**Men**		
		Fat	44 E%	Fat	43 E%	NS
		Carbohydrates	40	Carbohydrates	38	◆◆◆
		Sugar	9	Sugar	6	◆◆◆
		Protein	12	Protein	14	◆◆◆
		Alcohol	3.5	Alcohol	5.9	◆◆◆
		Total energy	14.7 MJ	Total energy	11.1 MJ	◆◆◆
		Women		**Women**		
		Fat	43 E%	Fat	41 E%	NS
		Carbohydrates	42	Carbohydrates	40	◆◆◆
		Sugar	9	Sugar	6	◆◆◆
		Protein	14	Protein	14	◆◆◆
		Alcohol	2.3	Alcohol	4.7	◆◆◆
		Total energy	9.1 MJ	Total energy	8.6 MJ	◆◆
8	Denmark	**Men**		**Men**		
		Fat	41 E%	Fat	37 E%	◆◆◆
		Saturated fat	18	Saturated fat	15	◆◆◆
		Carbohydrates	44	Carbohydrates	47	◆◆
		Sugar	9	Sugar	8	NS
		Alcohol	5	Alcohol	7	NS
		Energy	11.6 MJ	Energy	10.4 MJ	NS
		Women		**Women**		
		Fat	38 E%	Fat	37 E%	◆◆
		Saturated fat	16	Saturated fat	16	◆◆
		Carbohydrates	46	Carbohydrates	47	NS
		Sugar	9	Sugar	8	NS
		Alcohol	3	Alcohol	5	NS
		Energy	8.5 MJ	Energy	9.3 MJ	NS

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
48	UK (England, Scotland, Wales)	a) social class of head of household **Men** Fat 37 E% Saturated fat 15 Carbohydrates 43 Protein 14 Alcohol 6.4 **Women** Fat 39 E% Saturated fat 17 Carbohydrates 44 Protein 15 Alcohol 2	a) social class of head of household **Men** Fat 38 E% Saturated fat 16 Carbohydrates 41 Protein 14 Alcohol 6.7 **Women** Fat 39 E% Saturated fat 16 Carbohydrates 42 Protein 16 Alcohol 3.4	 NS NS NS ◆◆ NS NS NS ◆◆ ◆◆ ◆◆
30	Germany (West incl. West-Berlin)	**Men** Fat 39 E% Saturated fat 16 Carbohydrates 38 Protein 13 Alcohol 5.0 Energy 11.8 MJ **Women** Fat 41 E% Saturated fat 17 Carbohydrates 38 Protein 14 Alcohol 2.5 Energy 8.6 MJ	**Men** Fat 38 E% Saturated fat 16 Carbohydrates 39 Protein 13 Alcohol 5.5 Energy 11.6 MJ **Women** Fat 38 E% Saturated fat 16 Carbohydrates 14 Protein 40 Alcohol 3.9 Energy 9.0 MJ	
31	Germany (Augsburg)	**Men** Fat 42 E% (no alcohol) Carbohydrate 40 Protein 18 Energy (incl. alcohol) 10.6 MJ	**Men** Fat 42 E% (no alcohol) Carbohydrates 41 Protein 17 Energy (inc. alcohol) 10.8 MJ	NS ◆◆ ◆◆◆ ◆◆

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
37	Netherlands	a) socio-economic status	a) socio-economic status	
		Men	**Men**	
		Fat 41 E%	Fat 40 E%	♦
		Saturated fat 16	Saturated fat 17	NS
		Carbohydrates 41	Carbohydrates 41	NS
		Mono/disacch 20	Mono/disacch 20	NS
		Protein 13	Protein 13	NS
		Alcohol 2.4	Alcohol 3.2	♦
		Energy 11.8 MJ	Energy 11.2 MJ	♦
		Women	**Women**	
		Protein 14 E%	Protein 14 E%	NS
		Fat 42	Fat 40	♦
		Saturated fat 17	Saturated fat 17	NS
		Carbohydrates 42	Carbohydrates 42	NS
		Mono/disacch 21	Mono/disacch 20	NS
		Alcohol 0.9	Alcohol 1.9	♦
		Energy 8.5 MJ	Energy 8.5 MJ	NS
38	Netherlands	**Men**	**Men**	
		Fat 38 E%	Fat 37 E%	♦
		Saturated fat 14	Saturated fat 14	NS
		Carbohydrates 43	Carbohydrates 43	NS
		Mono/disacch 19	Mono/disacch 20	NS
		Protein 15	Protein 15	NS
		Alcohol 4.8	Alcohol 5.2	NS
		Energy 11.6 MJ	Energy 10.7 MJ	♦
		Women	**Women**	
		Fat 39 E%	Fat 36 E%	♦
		Saturated fat 15	Saturated fat 14	♦
		Carbohydrates 43	Carbohydrates 44	NS
		Mono/disacch 20	Mono/disacch 21	NS
		Protein 16	Protein 15	NS
		Alcohol 2.1	Alcohol 3.8	♦
		Energy 8.3 MJ	Energy 8.6 MJ	NS
41	Spain (Basque County)	**Men**	**Men**	
		Fat 31 E%	Fat 34 E%	NS
		Saturated fat 10	Saturated fat 12	♦♦♦
		Carbohydrates 43	Carbohydrates 41	NS
		Protein 14	Protein 15	NS
		Energy 2786	Energy 2851	
		Women	**Women**	
		Fat 37 E%	Fat 39 E%	♦♦
		Saturated fat 11	Saturated fat 13	♦♦♦
		Carbohydrates 44	Carbohydrates 42	NS
		Protein 14	Protein 15	♦♦
		Energy 1975	Energy 2143	

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
42	Spain (Catalonia)	a) social class	a) social class	
		Fat 38 E%	Fat 38 E%	♦♦♦
		Saturated fat 13	Saturated fat 13	♦♦♦
		Carbohydrates 42	Carbohydrates 41	NS
		Protein 17	Protein 17	NS
		Energy 2029	Energy 2017	
43	Spain (Navarra)	**Men**	**Men**	
		Fat 40 E%	Fat 42 E%	NS
		Saturated fat 13	Saturated fat 14	NS
		Carbohydrates 44	Carbohydrates 42	♦♦♦
		Sugar 16	Sugar 17	
		Protein 16	Protein 16	♦♦♦
		Alcohol 8.1	Alcohol 6.8	♦
		Energy 2893	Energy 2673	
		Women	**Women**	
		Fat 43	Fat 42	NS
		Saturated fat 6.7	Saturated fat 14	NS
		Carbohydrates 42	Carbohydrates 43	NS
		Sugar 17	Sugar 20	
		Protein 15	Protein 15	NS
		Alcohol 0.6	Alcohol 2.2	♦♦♦
		Energy 2024	Energy 2073	

B. ENERGY-YIELDING NUTRIENTS BY EDUCATION (household budget surveys)

Study No.	Country, Region	Low education[a]		High education[a]		Difference[b]
49	UK (England, Scotland, Wales)	a) income group		a) income group		
		Mean		**Mean**		
		Fat	40 E%	Fat	42 E%	—
		Saturated fat	17	Saturated fat	17	—
		Carbohydrates	49	Carbohydrates	47	—
		Sugar	7	Sugar	5	—
		Protein	14	Protein	14	—
		Total energy	8.4 MJ	Total energy	7.9 MJ	—
		1985		**1985**		
		Fat	90 g	Fat	90 g	NS
		Saturated fat	37.5 g	Saturated fat	38.6 g	NS
		Carbohydrates	246 g	Carbohydrates	206 g	♦♦
		Sugar	39.4 g	Sugar	23.5 g	♦♦
		Protein	65.4 g	Protein	63.3 g	NS
		Total energy	8.4 MJ	Total energy	7.7 MJ	NS
		1986		**1986**		
		Fat	94 g	Fat	89 g	NS
		Saturated fat	38.6 g	Saturated fat	36.9 g	NS
		Carbohydrates	242 g	Carbohydrates	209 g	♦♦
		Sugar	36.6 g	Sugar	18.4 g	♦♦
		Protein	67.2 g	Protein	63.8 g	NS
		Total energy	8.5 MJ	Total energy	7.7 MJ	NS
		1987		**1987**		
		Fat	92g	Fat	94 g	NS
		Saturated fat	37.2g	Saturated fat	38.8 g	NS
		Carbohydrates	238g	Carbohydrates	239 g	NS
		Sugar	32.0 g	Sugar	25.5 g	NS
		Protein	65.9g	Protein	69.2 g	NS
		Total energy	8.3 MJ	Total energy	8.5 MJ	NS
		1988		**1988**		
		Fat	89 g	Fat	84 g	NS
		Saturated fat	37.1 g	Saturated fat	34.4 g	NS
		Carbohydrates	242 g	Carbohydrates	216 g	♦♦
		Sugar	30.9 g	Sugar	20.4 g	♦♦
		Protein	67.1 g	Protein	62.9 g	NS
		Total energy	8.3 MJ	Total energy	7.6 MJ	♦♦
4	Poland					—
40	Poland					—
1	Belgium (3 regions)					—
3	Hungary (19 counties and capital)					—
6	Spain					—

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
44	Spain	Fat 40 E% Saturated fat 11 Carbohydrates 43 Protein 14 Energy 2905	Fat 42 E% Saturated fat 13 Carbohydrates 41 Protein 14 Energy 2328	♦♦ ♦♦ ♦♦ ♦♦
2	Greece (9 regions)			—
5	Greece			—
16-19	Finland			—
20-23	Finland			—
24-27	Finland			—
11 & 12	Estonia			—
13 & 14	Estonia			—
33 & 34	Lithuania			—
35	Lithuania (5 rural regions)			—
9	Denmark, Copenhagen County			—
10	Denmark, Copenhagen County			—
36	Netherlands			—
47	Switzerland			—

A. CONSUMPTION OF MEALS BY EDUCATION

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
39	Norway			—
28	Finland (4 regions)			—
45	Sweden			—
7	Denmark			—
8	Denmark			—
48	UK (England, Scotland, Wales)			—
30	Germany (West incl. West-Berlin)	**MEN** Meals on working day -1st breakfast 94% -2nd breakfast 43% -lunch 93% -afternoon snack 46% -dinner 98% -late snack 18% Meals on weekend -1st breakfast 90% -2nd breakfast 18% -lunch 93% -afternoon snack 66% -dinner 96% -late snack 18% **WOMEN** Meals on working day -1st breakfast 96% -2nd breakfast 31% -lunch 95% -afternoon snack 57% -dinner 98% -late snack 14% Meals on weekend -1st breakfast 94% -2nd breakfast 19% -lunch 94% -afternoon snack 73% -dinner 95% -late snack 14%	**MEN** Meals on working day -1st breakfast 92% -2nd breakfast 37% -lunch 89% -afternoon snack 41% -dinner 96% -late snack 20% Meals on weekend -1st breakfast 87% -2nd breakfast 18% -lunch 85% -afternoon snack 60% -dinner 94% -late snack 21% **WOMEN** Meals on working day -1st breakfast 95% -2nd breakfast 38% -lunch 89% -afternoon snack 51% -dinner 96% -late snack 16% Meals on weekend -1st breakfast 88% -2nd breakfast 19% -lunch 82% -afternoon snack 67% -dinner 93% -late snack 19%	 ◆◆ NS ◆◆ ◆◆ ◆◆ ◆◆ NS NS ◆◆ ◆◆ ◆◆ ◆◆ NS ◆◆ ◆◆ ◆◆ ◆◆ ◆◆ ◆◆ NS ◆◆ ◆◆ ◆◆ ◆◆
31	Germany (Augsburg)			—

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
37	Netherlands	a) socio-econimic status Skipping breakfast -both days 10% -one day only 9%	a) socio-econimic status Skipping breakfast -both days 4% -one day only 7%	♦
38	Netherlands			—
41	Spain (Basque County)			—
42	Spain (Catalonia)			—
43	Spain (Navarra)			—

B. CONSUMPTION OF MEALS BY EDUCATION (household budget surveys)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
49	UK (England, Scotland, Wales)			—
4	Poland			—
40	Poland			—
1	Belgium (3 regions)			—
3	Hungary (19 counties and capital)			—
6	Spain			—
44	Spain			—
2	Greece (9 regions)			—
5	Greece			—

C. CONSUMPTION OF MEALS BY EDUCATION (frequency)

Study No.	Country, Region	Low education[a)]	High education[a)]	Difference[b)]
16-19	Finland	**Men** Daily breakfast 61% Two hot meals daily 41% **Women** Daily breakfast 68% Two hot meals daily 33%	**Men** Daily breakfast 65% Two hot meals daily 43% **Women** Daily breakfast 71% Two hot meals daily 27%	 ♦ NS ♦ ♦♦♦
20-23	Finland	**Men** Daily breakfast 71% Two hot meals daily 36% **Women** Daily breakfast 80% Two hot meals daily 29%	**Men** Daily breakfast 80% Two hot meals daily 39% **Women** Daily breakfast 85% Two hot meals daily 25%	 ♦ ♦♦ ♦♦♦ ♦
24-27	Finland	**Men** Daily breakfast 72% Two hot meals daily 33% **Women** Daily breakfast 80% Two hot meals daily 28%	**Men** Daily breakfast 79% Two hot meals daily 39% **Women** Daily breakfast 85% Two hot meals daily 24%	 ♦♦♦ ♦ ♦♦♦ ♦
11 & 12	Estonia	**Men** Daily breakfast 79% Two hot meals daily 62% **Women** Daily breakfast 85% Two hot meals daily 61%	**Men** Daily breakfast 85% Two hot meals daily 61% **Women** Daily breakfast 88% Two hot meals daily 43%	 ♦♦ NS NS ♦♦♦
13 & 14	Estonia	**Men** Daily breakfast 87% Two hot meals daily 66% **Women** Daily breakfast 85% Two hot meals daily 64%	**Men** Daily breakfast 87% Two hot meals daily 60% **Women** Daily breakfast 83% Two hot meals daily 45%	 NS ♦♦ ♦♦ ♦♦♦
33 & 34	Lithuania			—
35	Lithuania (5 rural regions)			—
9	Denmark, Copenhagen County			—
10	Denmark, Copenhagen County			—
36	Netherlands	Persons eating every day a hot meal 63%	Persons eating every day a hot meal 68%	♦
47	Switzerland			—

APPENDIX 11

Meta-analysis table

Study number: Country: Year:
Participation rate: % Representative sample: YES
Method of dietary assessment: _____
Age:

	WOMEN (grams/person/day)						MEN (grams/person/day)					
	HIGH EDUCATION			LOW EDUCATION			HIGH EDUCATION			LOW EDUCATION		
	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n
FRUITS , TOTAL												
VEGETABLES,TOTAL												
FATS AND OILS (ADDED)												
- BUTTER												
- MARGARINE												
-VEGETABLE OILS												
MEAT, TOTAL												
DAIRY, TOTAL												
- CHEESE												
- MILK												
-FULLFAT MILK												
-SKIMMED MILK												
SUGAR												
	WOMEN (% of total energy)						MEN (% of total energy)					
TOTAL FAT												
SATURATED FAT												
MONOUNSATURATED FAT												
CARBOHYDRATE												
SUGAR												
PROTEIN												
ALCOHOL												
TOTAL ENERGY INTAKE (kcal)												