

Use of butter and cheese in 10 European countries

A case of contrasting educational differences

RITVA S. PRÄTTÄLÄ, MARGIT V. GROTH, ULRICH S. OLTERSDFORF, GUN M. ROOS,
WLODZIMIERZ SEKULA, HELENA M. TUOMAINEN *

Background: This paper aims to analyse socioeconomic variation in the use of cheese and butter in Europe by reviewing existing dietary surveys. It explores whether socioeconomic differences in the intake of these foods follow a similar pattern in all countries. **Methods:** An overview of available studies on socioeconomic differences in food habits in Europe over the period 1985–1997 was performed. Twenty studies from 10 countries included information on cheese and butter. A simple directional vote-counting method was used to register the association between educational level and consumption of cheese and butter (animal fat) for each study. **FAO's** food balance sheets were used to classify the countries according to consumption trends of these foodstuffs. **Results:** In all countries higher social classes used more cheese than lower classes. The results for butter were less consistent. In the Nordic countries higher social classes used less butter than lower ones. In the other countries an opposite pattern or no differences could be observed. However, in countries where the use of both butter and animal fats could be analysed, animal fats were used more by the lower social classes. **Conclusions:** Higher and lower socioeconomic groups have different sources of saturated fats. Higher social classes use more cheese whereas lower social classes use more butter or animal fats. This can be observed especially in countries where the consumption of cheese is increasing and that of butter decreasing. Higher social classes prefer modern foods, lower classes traditional foods.

Keywords: butter, cheese, European countries, modern and traditional foods, socioeconomic differences

Mortality from cardiovascular diseases varies by socioeconomic status in many European countries.¹ Despite a decrease in overall mortality socioeconomic differences have remained.² There are diverse opinions about why socioeconomic mortality differences remain. Structural, cultural, behavioural and psychosocial factors are all believed to contribute to inequalities in health.^{3–5} One possible explanation is linked with food behaviour: people from higher socioeconomic groups seem to have healthier food habits than those from lower groups. Indeed, some European studies have shown that those socioeconomically better off consume more fruit and vegetables^{5–8} and in general have more health-conscious behaviours than those less well off.^{3,9}

A recent study of the consumption trends of foodstuffs in France from 1965 to 1991 shows that higher social classes consumed more food items that indicated an increasing trend in use than lower classes.¹⁰ Conversely, the majority

of food items on the decline, mostly 'traditional' foods, were consumed in larger quantities by lower socioeconomic groups than by higher ones. These findings are in line with Bourdieu's theory that the socioeconomically better-off are the first to adopt new food habits.¹¹ Although there are no actual follow-up studies on the development of food habits in different socioeconomic groups in Europe, some analyses support the assumption.^{12,13} Research based on 33 studies representing 15 European countries revealed that in regions where the consumption of fruit and vegetables had traditionally been low but was on the increase, people with higher education tended to consume more of these 'modern' foods than those with lower education.⁸

This paper continues the analyses of socioeconomic differences in the consumption of food in Europe. Previously the focus was on fruit and vegetables,^{6,8} this time it is on sources of saturated fat. High intake of saturated fat is a risk factor for cardiovascular diseases,¹⁴ and the consumption of high-fat dairy products has also been associated with an increased risk.¹⁵ If individuals with a higher socioeconomic position have healthier food habits and try to limit the intake of saturated fats, then they should consume less butter and cheese than those with a lower socioeconomic position. However, some studies have suggested that socioeconomic differences in the intake of saturated fat are not very large.¹⁶ It seems that differences in the consumption of foodstuffs are larger, and that not all food habits of the higher social classes are in line with dietary recommendations. For example, there

* R.S. Prättälä¹, M.V. Groth², U.S. Oltersdorf³, G.M. Roos⁴, W. Sekula⁵, H.M. Tuomainen⁶

¹ National Public Health Institute (KTL), Department of Epidemiology and Health Promotion, Finland

² Institute of Public Health, Department of Social Medicine and Psychosocial Health, University of Copenhagen, Denmark

³ Federal Research Centre for Nutrition, Institute of Nutritional Economics and Sociology, Karlsruhe, Germany

⁴ National Institute for Consumer Research (SIFO), Norway

⁵ National Food and Nutrition Institute, Poland

⁶ School of Health and Social Studies, University of Warwick, UK

Correspondence: Ritva Prättälä, PhD, National Public Health Institute, Department of Epidemiology and Health Promotion, Mannerheimintie 166, FIN-00300 Helsinki, Finland, tel. +358 9 47448631, fax +358 9 47448338

are indications that people from higher socioeconomic groups eat more cheese but less butter than those from lower groups.^{13,17}

Previous studies suggest two hypotheses that may be contradictory. First, people with a higher socioeconomic position follow healthier lifestyles than those with a lower socioeconomic position ('health hypothesis'); second, the socioeconomically better-off are the first to adopt modern food habits ('modernity hypothesis'). Yet what happens if a modern food is unhealthy?

If individuals with a higher socioeconomic position are more motivated to avoid saturated fats than those belonging to lower socioeconomic groups, then they should use both butter and cheese less. This should especially be the case in countries where these foods show a declining trend in consumption. On the other hand, if in a country there is an increasing trend in the consumption of either cheese or butter, then the higher socioeconomic groups are most likely to be the first to increase their intake and consume more of them.

Our goal is to analyse socioeconomic variation in the use of cheese and butter in Europe by reviewing existing survey data systematically. The idea is to explore whether the use of these two foodstuffs follows a similar socioeconomic pattern in all countries. The findings will be examined with the help of data on food consumption trends for cheese and butter (animal fat) from the same countries.

The paper is based on data collected for an international study, 'Disparities in food habits'.¹⁸ The study was part of an EU Concerted Action project 'Compatibility of the household and individual nutrition surveys in Europe and disparities in food habits'. The 'Disparities' study aimed at providing a comprehensive overview of existing data sources and published studies on socioeconomic differences in food habits in Europe over the period 1985–1997. Studies from 15 countries were included in the original review. Comparable studies on cheese and butter were obtained from 10 countries: Finland, Norway, Denmark, UK, Germany, Belgium, Poland, Hungary, Spain and Greece.

METHODS

Identification of studies

The two main methods for identifying relevant studies were computerized literature searches and a questionnaire to researchers. The methods of the 'Disparities in food habits' project have been described in detail in the basic report of the project.¹⁸ Several reference databases, such as Medline, Database Uncover, Social Science Search, Social Science Citation Index and Nutrition Abstracts were searched for literature. Keywords reflected the objectives of the Disparities project and were the result of discussions among project members. A number of keywords were used for disparities (socioeconomic status, education, occupation, social class, income, employment, poverty, gender and region) and for food habits (food, meal, nutrients, nutrition, diet and eating, fruit, vegetables). In addition to database searches, documentation centres, recent books and issues of the most relevant journals were

consulted. Furthermore, researchers working in the field and/or participating in the project answered a mailed questionnaire with questions on key references, relevant studies and names of other researchers in the field. The questionnaire focused on published studies or reports. Some unpublished results were provided by project members who had access to the original data. Altogether 47 researchers were contacted, and 27 researchers from 16 European countries responded. Qualitative classification and meta-analysis were used to synthesize the search findings. The results of the meta-analyses are published elsewhere.^{6,16}

The project group defined disparities in food habits as the 'differences in food consumption based on education and/or occupation among adult men and women'.¹⁸ For a study to be included in the systematic review presented in this paper, it had to fulfil the following criteria:

- The period of data collection should be 1985–97.
- The subjects should be adults (18–65 years).
- The study should include information on the consumption of cheese and/or butter/animal fat by education and/or occupation.

Of 33 studies which originally qualified for the basic review on disparities in food habits, 20 studies from 10 countries were eligible for this analysis of cheese and butter consumption (*table 1*). Both individual dietary surveys and household budget surveys were accepted, even if the latter did not include consumption data for men and women separately. The surveys reported fat consumption generally by indicating the total use of fat and then splitting it into various subgroups (e.g. butter, margarine, oil). Alternatively, the use of lipids of animal and vegetable origin were reported separately. Even if the study did not contain information on the use of butter, it qualified for the review if it included data on animal fat. The food group of dairy products was mostly divided into the use of milk, cheese and other dairy products (e.g. yoghurt and ice cream).

The Disparities project group selected education as the main measure of socioeconomic status because it was the most common measure in the studies identified. If information on education was missing then the next common measure, occupation or income, was used instead. Education has some advantage over occupation or income, as it forms an ordinal scale and undergoes only minor changes over adult life.³⁴ For a study to be chosen, education had to be reported as the number of school years or as at least three educational levels.

The suitability of the studies was evaluated according to criteria agreed by the project members. The representativeness of the sample and response rate were taken into account at this stage. The Belgian study had an exceptionally low response rate (11%). However, the project team decided to include it in the original Disparities review.¹⁸ It was therefore included in this review as well but the results on Belgium should be treated with special caution.

Of the 20 studies, 9 were individual dietary surveys and 11 household budget surveys (*table 1*). The individual

Table 1 Characteristics of the surveys

Country (region)	Name of study	Study year		N	Response rate %	SES-variables ^a	Dietary assessment method
Dietary surveys at the individual level							
Norway ¹⁹	NORKOST	1993–1994	Men	1,517	62	Education	Food frequency questionnaire
			Women	1,627	64		
			All	3,144	63		
Finland (4 regions) ^{13,20}	The 1992 Dietary Survey of Finnish Adults	1992 spring	Men	870	61	Education	3 day non-weighted dietary record, food frequency questionnaire
			Women	991	71		
			All	1,861	66		
Denmark ²¹	Dietary Habits in Denmark	1985	Men	1,086	75	Education	Diet history
			Women	1,156	77		
			All	2,242	76		
Denmark ⁷	Dietary Habits in Denmark	1995	Men	678		Education	7 day estimated food record
			Women	731			
			All	1,409	61		
GB (England, Scotland, Wales) ²²	National Diet and Nutrition Survey (NDNS)	1986–1987	Men	1,087		Occupation	7 day weighed dietary record
			Women	1,110			
			All	2,197	70		
Germany (West incl. West Berlin) ²³	German National Food Intake Survey (NVS)	1985–1989	Men	10,901		Education	7 day non-weighted dietary record, food frequency questionnaire
			Women	12,308			
			All	23,209	74		
Germany (Augsburg and 2 counties) ²⁴	MONICA Augsburg	1984–1985	Men	899	70	Education	7 day weighed dietary record
Spain (Basque Country) ²⁵	Food Habits in Basque Country	1990	Men	1,143		Education	Three 24-hour recalls, food frequency questionnaire
			Women	1,205			
			All	2,348	73		
Spain (Navarra) ²⁶	Food Habits in Navarra's Population	1989–1990	Men	367		Education	Diet history
			Women	337			
			All	704	95		
Household budget surveys							
GB (England, Scotland, Wales) ²⁷	National Food Survey	1985	hh	7,115	53	Income	Household purchases, food account (7 days)
GB (England, Scotland, Wales) ²⁸	National Food Survey	1986	hh	6,925	51	Income	Household purchases, food account (7 days)
GB (England, Scotland, Wales) ²⁹	National Food Survey	1987	hh	7,163	54	Income	Household purchases, food account (7 days)
GB (England, Scotland, Wales) ³⁰	National Food Survey	1988	hh	7,320	56	Income	Household purchases, food account (7 days)
Poland ³¹	Polish Household Budget Survey (DAFNE I)	1988	hh	29,664	60	Education	Household purchases, food account
Poland ^b	Polish Household Budget Survey	1996	hh	31,907	69	Education	Household purchases
Belgium (3 regions) ³¹	Belgian Household Budget Survey (DAFNE I)	1987–1988	hh	3,235	11	Education	Household purchases, food account
Hungary (19 counties and capital) ³¹	Hungarian Household Budget Survey (DAFNE I)	1991	hh	11,813	73	Education	Household purchases, food account
Spain ³²	Spanish Household Budget Survey	1990–1991	hh	21,155	79	Education	Diet history (7 days)
Greece (9 regions) ³¹	Greek Household Budget Survey (DAFNE I)	1987–1988	hh	6,489	94	Education	Household purchases, food account
Greece ³³	Greek Household Budget Survey (DAFNE II)	1993–1994	hh	6,756	79	Education	Household purchases, food account

hh: households

a: Socioeconomic status variables

b: W. Sekula, personal communication

dietary surveys give information on consumption of food whereas the household budget surveys report the availability of food. All regions of Europe were represented (north, south, east and west). Most of the studies were based on national samples. One of the two Spanish dietary surveys was from the Basque county,²⁵ the other from Navarra²⁶ (only cheese). Five studies did not include information on food consumption based on education. The British studies gave results according to the occupation or income of the household head. All but three studies contained data on butter consumption: one German²³ and one Spanish²⁵ study reported the use of animal fat, and one Spanish²⁶ study did not report the use of butter or animal fat.

Reviewing the studies

The results of the individual studies were combined by using a simple vote-counting method.³⁵ Each study was taken at face value and the association between high education (occupation, income) and consumption of cheese and butter (or animal fat) was registered for all studies. Vote counts took into account only the direction

Table 2 Consumption of cheese, butter and animal fats in 10 European countries based on food balance sheets (kg/person/year) 1985–1996

Country	Year	Cheese	Butter	Animal fats
Finland	1985–1988	10.1	9.7	16.6
	1989–1992	12.8	7.5	14.9
	1993–1996	13.9	6.8	14.0
Norway	1985–1988	13.7	4.4	18.0
	1989–1992	14.5	3.1	18.3
	1993–1996	14.8	2.6	17.5
Denmark	1985–1988	10.6	7.1	23.9
	1989–1992	13.8	4.8	26.8
	1993–1996	15.7	2.3	26.9
UK	1985–1988	7.1	4.8	12.3
	1989–1992	7.9	3.6	10.5
	1993–1996	8.6	3.4	9.6
Germany	1985–1988	15.7	9.5	20.7
	1989–1992	17.1	7.4	20.1
	1993–1996	17.5	7.0	20.1
Benelux	1985–1988	12.0	8.8	28.1
	1989–1992	13.5	7.8	30.1
	1993–1996	13.7	6.5	26.9
Poland	1985–1988	11.6	8.8	25.2
	1989–1992	9.0	7.0	21.1
	1993–1996	9.1	4.0	15.0
Hungary	1985–1988	7.7	2.6	33.4
	1989–1992	6.9	1.9	31.3
	1993–1996	7.4	1.5	26.0
Spain	1985–1988	4.8	0.5	3.6
	1989–1992	5.2	0.6	4.9
	1993–1996	5.7	0.3	4.1
Greece	1985–1988	23.0	0.9	2.4
	1989–1992	24.4	1.0	2.4
	1993–1996	24.4	1.0	3.4

Source: FAO 1999

of findings. The association between high education (occupation, income) and consumption was classified as either positive or negative. Once the number of results in each direction was counted, a sign test was performed to discover if the cumulative results suggested that a particular direction was too frequent to be considered mere chance.

The formula used for computing the sign test was:

$$Z = \frac{(N_p) - (\frac{1}{2}N)}{\frac{1}{2}\sqrt{N}}$$

Z = the z-score for the overall series of findings; N_p = the number of positive findings; N = the total number of findings (positive and negative findings).

Separate z-scores were calculated for men and women based on the individual dietary surveys and for household budget surveys.

The use of food balance sheets

To obtain a picture of the role of cheese, butter and animal fat in the national diets, food balance sheets data showing per capita food supply derived from the FAO computerized data bank (FAOSTAT)³⁶ were referred to. The data are based on accounts at the national level of annual production of foods, imports, exports, stock changes, and agricultural and industrial uses within a country. Information was retrieved for each country on the overall consumption trends of the three foodstuffs (kg/person/year). Consumption trends (increasing, decreasing, or no trend) were estimated for the time period 1985–1996 by calculating the means for the years 1985–1988, 1990–1992 and 1993–1996. Trend data were available for all other countries except Belgium, for which data referring to Benelux countries were used (table 2).

RESULTS

Classification of countries according to consumption trends of cheese and butter

According to the food balance sheet data, the 10 countries included in this review showed different trends and consumption levels of cheese, butter and animal fat (table 2). In Norway, Finland, Denmark, Germany, Benelux and Great Britain, cheese consumption increased systematically between 1985 and 1996 whereas butter consumption decreased. Hence, in these countries cheese can be considered a modern and butter a traditional food. In Norway, Finland and Great Britain, consumption of animal fat decreased as well, but no trend was observed for Denmark, Germany and Benelux. In Hungary and Poland, butter and animal fat consumption decreased but the consumption of cheese remained stable, indicating that animal fat and butter are traditional foods whereas cheese does not have a clear role as a modern food in these countries. In Spain and Greece, the consumption levels of butter and animal fat were very low; these foods are not traditional in the Mediterranean countries. Cheese consumption increased in Spain whereas in Greece the increase was not so obvious.

Socioeconomic differences in the use of cheese and butter

With regard to socioeconomic differences, the pattern for cheese consumption was consistent: people from higher social classes used more cheese than those from lower classes (table 3a and 3b). This pattern was more systematic for women (z-score=2.8, $p<0.0025$) than men (z-score=1.4, NS). All 11 household budget surveys showed a positive association between cheese consumption and socioeconomic status (z-score=3.3, $p<0.0025$).

For butter, the picture was not so clear-cut (table 4a and 4b). For men, in these cases (z-score -0.4, NS) and for women in one case (z-score -1.3, NS) butter consumption was higher in the lower socioeconomic group. However, only one household budget survey indicated higher butter consumption in the lower socioeconomic group (z-score 1.6, NS). Yet with regard to other animal fats, seven household budget surveys showed higher use in the lower socioeconomic group (z-score -2.6, $p<0.005$).

In the three Nordic countries, people from higher social classes used less butter than those from lower classes. In Great Britain, Belgium and Poland the pattern was reversed, i.e. the higher classes used more butter. In Great Britain and Poland, however, the lower classes used more other animal fats than the higher classes. In Hungary no differences were observed in the use of butter, but the lower classes used more other animal fats.

In Greece and Spain, where the use of both butter and animal fat was at a very low level, higher socioeconomic groups used slightly more butter, or no differences could be observed.

DISCUSSION

Several types of limitations have to be taken into account when interpreting these results. These are related to the identification of studies, time of data collection, age of respondents, methods used in the selected studies,

Table 3a Consumption of cheese by education (g/day): dietary surveys at individual level

Country		Low education	High education	Association ^b
Norway ¹⁹	Men	36	35	-
	Women	27	33	+
Finland (4 regions) ^{13,20}	Men	29	36	+
	Women	33	40	+
Denmark ²¹	Men	55	55	None
	Women	44	56	+
Denmark ⁷	Men	33 g/10 MJ	29 g/10 MJ	-
	Women	37 g/10 MJ	44 g/10 MJ	+
GB (England, Scotland, Wales) ^{22 a}	Men	15	21	+
	Women	11	18	+
Germany (West incl. West Berlin) ²³	Men	36	50	+
	Women	35	49	+
Germany (Augsburg) ²⁴	Men	25	39	+
	Women	11	26	+
Spain (Basque County) ²⁵	Men	11	26	+
	Women	12	24	+
Spain (Navarra) ²⁶	Men	4	5	+
	Women	3	5	+

a: occupation.

b: + Higher educational group consumes more; - Lower educational group consumes more.

Table 3b Consumption of cheese by education (g/day): household budget surveys

Country	Low education	High education	Association ^b
GB (England, Scotland, Wales) ^{27 a}	13	18	+
UK (England, Scotland, Wales) ^{28 a}	13	21	+
UK (England, Scotland, Wales) ^{29 a}	15	20	+
UK (England, Scotland, Wales) ^{30 a}	14	19	+
Poland ³¹	48	53	+
Poland ^c	24	39	+
Belgium ³¹	36	47	+
Hungary (19 counties and capital) ³¹	8	18	+
Spain ³²	15	20	+
Greece (9 regions) ³¹	50	68	+
Greece ³³	42	48	+

a: Income group.

b: + Higher educational group consumes more; - Lower educational group consumes more.

c: W. Sekula, personal communication.

response bias by socioeconomic status and the classification of foods in the surveys. The collectively agreed selection criteria, as well as the definition of food disparities, were set to deal with the problems. However, some problems were difficult to overcome, such as the diverse forms of classification of socioeconomic status and the variation in the number and size of classes. Instead of comparing absolute differences, the variation in cheese and butter consumption was assessed based on socio-

economic status within each study and then compared the resulting patterns. This was done to reduce the problem related to the heterogeneity of the studies.

It may be questioned how well the studies represent the whole country because some of them were regional. However, most of the studies were large-scale, based on random samples, and had adequate response rates. To limit the problems with the sample, only studies from the years 1985–1997 focusing on adults were included. It is

Table 4a Consumption of butter (or animal fats) by education (g/day): dietary surveys at individual level

Country		Low education	High education	Difference ^c
Norway ¹⁹	Men	5	3	-
	Women	3	2	-
Finland (4 regions) ^{13,20}	Men	23	15	-
	Women	13	12	-
Denmark ²¹	Men	30	25	-
	Women	21	20	-
Denmark ⁷	Men	29 g/10MJ	14 g/10MJ	-
	Women	18 g/10MJ	13 g/10MJ	-
GB (England, Scotland, Wales) ^{22 a}	Men	7	7	None
	Women	6	6	None
Germany (West incl. West Berlin) ^{23 b}	Men	23	24	+
	Women	19	19	None
Germany (Augsburg) ²⁴	Men	17	18	+
	Spain (Basque County) ^{25 b}	Men	3	4
Women		1	5	+

a: Occupation.

b: Animal fats.

c: + Higher educational group consumes more; - Lower educational group consumes more.

Table 4b Consumption of butter and other animal fats by education (g/day): household budget surveys

Country		Low education	High education	Difference ^b
GB (England, Scotland, Wales) ^{27 a}	Butter	8	12	+
	Other	7	2	-
GB (England, Scotland, Wales) ^{28 a}	Butter	6	10	+
	Other	8	2	-
GB (England, Scotland, Wales) ^{29 a}	Butter	7	9	+
	Other	6	3	-
GB (England, Scotland, Wales) ^{30 a}	Butter	8	8	None
	Other	5	2	-
Poland ³¹	Butter	27	27	None
	Other	31	8	-
Poland ^c	Butter	10	14	+
	Other	15	5	-
Belgium (3 regions) ³¹	Butter	8	11	+
	Other	1	1	None
Hungary (19 counties and capital) ³¹	Butter	4	4	None
	Other	40	14	-
Spain ³²	Butter	1	1	None
Greece (9 regions) ³¹	Butter	3	2	-
	Other	0	0	None
Greece ³³	Butter	1	1	None
	Other	0	0	None

a: Income groups.

b: + Higher educational group consumes more; - Lower educational group consumes more.

c: W. Sekula, personal communication.

well established that the level of education within a population increases over time. Also, younger adults usually have higher levels of education than older adults. If educational differences in food habits change rapidly, cumulating results from studies covering a period of 12 years may lead to biases. Only a few of the studies^{7,13,19} presented data on food consumption in different age groups and only one¹³ contained data on educational differences adjusted for age. Age differences in consumption were rather small and unsystematic, and educational differences remained after adjusting for age. With regard to time period, socioeconomic differences in food habits seem to change rather slowly,^{12,27-30} which suggests that differences in the time of data collection do not distort conclusions on socioeconomic differences.

Methods used in the selected studies varied. All methods relying on self-reported behaviour are subject to problems of reporting error and bias. Underreporting is especially linked with fat intake.³⁷ Underreporting has also been associated with a lower socioeconomic position.³⁸ However, there is evidence that those socioeconomically better-off inform their actual consumption levels falsely as well.³⁹ Since most individuals in Europe are subject to messages about the health effects of dietary fats, it is very likely that the disparities presented in this analysis remain after taking underreporting into consideration.

The classification of fats and cheeses in the various studies is a further possible source of error. In addition to butter, 'animal fat' may consist of other substances. Moreover, the food group 'cheese' may contain a dissimilar selection of dairy products in the different countries.

The shortcomings described above distort less the comparison of socioeconomic differences within the studies. So even if direct comparisons between the countries may be questionable, the results of comparing socioeconomic patterns are more reliable.

The advantage of the directional vote-counting method is that information from all findings, not only the statistically significant ones, can be used. However, vote counts cannot weight a finding's contribution by its sample size. Furthermore, the magnitude of the comparison or relationship revealed in each finding is not considered. A practical problem with the directional vote count is that primary researchers do not frequently report the direction of results, especially if a comparison was statistically non-significant. According to Cooper,³⁵ however, the vote count of directional findings can still be an informative complement to other meta-analytic procedures. About half of the studies included in this review did not fulfil the requirements for meta-analysis.¹⁶

Although the idea of FAO's food balance sheets is to offer comparable information there are limitations in the use of this data. Procedures of handling and calculating the figures may vary among countries. Classification of foods causes problems as well.^{36,40} However, comparing trends instead of absolute figures and using averages from several years level off biases in the data. In addition, some Nordic research suggests that statistics on cheese

and butter are more reliable than those on, for example, fruit and vegetables.⁴¹

Two assumptions were made about the socioeconomic variation in cheese and butter consumption. According to the 'health hypothesis', individuals with a higher socioeconomic position should use less foods with a high content of saturated fats, i.e. cheese and butter, and according to the 'modernity hypothesis' they should use more modern foods, i.e. foods showing an increasing general trend in consumption.

If we look at butter, half of the cases are against the health hypothesis; i.e. higher socioeconomic groups use more. However, if we take into account also the figures for animal fat, then most of the cases support the health hypothesis. With regard to cheese, 15 out of 19 cases are against the health hypothesis. Thus, the health hypothesis can be rejected for cheese, but for butter it cannot be rejected nor accepted.

According to the food balance sheet data, there was an increasing overall trend in cheese consumption in eight of the ten countries studied; in Hungary and Poland there was no increase between 1985 and 1996. Hence, based on the modernity hypothesis, cheese should be used more by higher social classes everywhere else but in Hungary and Poland. However, results reveal that higher socioeconomic groups preferred cheese in all countries, i.e. also in Hungary and Poland. These two countries underwent a major economic transition at the end of the 1980s and early 1990s. This resulted in considerably higher prices and, for this reason, lower demand for certain food items. The decreasing trend of cheese consumption is obviously associated with the economic changes and does not have much to do with the idea of modern vs. traditional foods. If we look at the consumption trends of butter, the food balance sheets indicate a decreasing trend everywhere but in Mediterranean countries. According to the modernity hypothesis butter should therefore be used more by lower socioeconomic groups everywhere but in Greece and Spain. Results from these two countries, as well as from Finland, Norway and Denmark corroborate this assumption, but those from Great Britain, Belgium and Poland do not. Findings from the latter three countries indicate that people from higher social classes were the ones who consumed more butter.

The reasons for the higher use of butter among the socioeconomically better-off in Poland may again be related to the effects of the economic transition period. Another reason why butter consumption does not support the modernity hypothesis is linked with the consumption pattern of other animal fats. The use of other animal fats varied greatly by socioeconomic status in Poland and Hungary, lower socioeconomic groups consuming more of these traditional foods.

When the use of other animal fats was taken into account in the British studies, socioeconomic differences followed the expected direction; i.e. lower social classes used animal fats more than higher classes. For Belgium, the explanation for the higher consumption level of butter among the socioeconomically better-off is likely to be

related to methodological problems stated earlier on, i.e. the very low response rate and lack of consumption statistics for Belgium alone. Excluding the study does not affect the overall results significantly. A more recent survey conducted in Belgium suggests a different picture, which is in better accordance with our hypotheses (Liesbeth Temme, personal communication).

CONCLUSIONS

Based on the results of this paper, different socioeconomic groups appear to have different foodstuffs as sources of saturated fats: the higher social classes prefer cheese, the lower classes prefer butter or other animal fats. This is one of the reasons why socioeconomic differences in the intake of fats have been found to be smaller at the nutrient level than at the level of foodstuffs. According to the original health hypothesis, higher socioeconomic classes should use less of both butter and cheese because of their high content of saturated fat. This hypothesis could not be accepted.

The fat content of food is just one selection criteria of what to eat. Due to the culinary role of cheese, those socioeconomically better-off may disregard its high content of saturated fat. Cheese is a good example of how cultural factors play a significant part in food choice. Higher standard of living, sophisticated gastronomy, and the luxuriousness of certain varieties of cheese may all explain the increase in cheese consumption and the reason why higher socioeconomic groups are the first to consume more cheese, and to include new varieties of it in their diet. Also, because nutrition education has probably focused more on butter, cheese has not generally been considered as 'unhealthy' as butter. This may be the case especially in countries where milk consumption is low and cheese is a significant source of dietary calcium. Since people from lower social classes usually imitate the food habits of those socioeconomically better off – albeit with a time lag¹² – cheese, especially the high-fat varieties, might become an increasing dietary problem in countries where the intake of saturated fat is already high. Ironically, by the time that people from lower socioeconomic groups consume high-fat cheese in larger quantities, those with a higher socioeconomic position may have already shifted to 'healthy' low-fat varieties, or to some other 'trendier' food. If people from lower socioeconomic groups imitate the negative aspects of the food habits of those in higher socioeconomic position, nutritional disparities, and later also health inequalities related to them, may increase in the future.

The present study was supported by the European Union's FAIR programme and was part of the FAIR-97-3096 concerted action project entitled 'Compatibility of the household and individual nutrition surveys in Europe and disparities in food habits'.

The members of the FAIR-97-3096 Disparities group (M. Groth, C. Hupkens, S. Jansson, L. Johansson, A. Kasmel, J. Klumbiené, J.A. Martínez, M.A. Martínez-González, A. Naska, M. Nelson, U. Oltersdorf, R. Prättälä, A-M. Remaut-De Winter, G. Roos, W. Sekula, A. Trichopoulou and K. Trygg) provided published and unpublished data from their countries and participated in workshops.

In addition, other European researchers provided information, among these Dr Liesbeth Temme from Belgium. The technical support of Ms Pia Nikander, in finalizing the paper is gratefully acknowledged.

The Finnish National Public Health Institute and the Finnish Ministry of Agriculture and Forestry supported the study.

REFERENCES

- 1 Tunstall-Pedoe H, Kuulasmaa K, Mähönen M, et al. Contribution of trends in survival and coronary-event rates to changes in coronary heart disease mortality: 10-year results from 37 WHO MONICA Project populations. *Lancet* 1999;353(9164):1547-57.
- 2 Mackenbach JP, Kunst AE, Cavelaars AE, Groenhouf F, Geurts JJ, the EU Working Group on Socioeconomic Inequalities in Health. Socioeconomic inequalities in morbidity and mortality in Western Europe. *Lancet* 1997;349(9066):1655-9.
- 3 Blaxter M. Health and lifestyles. London: Routledge, 1990.
- 4 Whitehead M. Bridging the gap: working towards equity in health and health care [dissertation]. Sundbyberg: Karolinska Institutet, 1997.
- 5 Cavelaars A. Cross-national comparisons of socio-economic differences in health indicators [dissertation]. Rotterdam: Erasmus University Rotterdam, 1998.
- 6 Irala-Estevez JD, Groth M, Johansson L, Oltersdorf U, Prättälä R, Martínez-González MA. A systematic review of socio-economic differences in food habits in Europe: consumption of fruit and vegetables. *Eur J Clin Nutr* 2000;54(9):706-14.
- 7 Groth MV, Fagt S, Brøndsted L. Social determinants of dietary habits in Denmark. *Eur J Clin Nutr* 2001;55(11):959-66.
- 8 Roos G, Johansson L, Kasmel A, Klumbiené J, Prättälä R. Disparities in vegetable and fruit consumption: European cases from the north to the south. *Public Health Nutr* 2001;4(1):35-43.
- 9 Karisto A, Prättälä R, Berg M-A. The good, the bad and the ugly: differences in changes in health related lifestyles. In: Kjaernes U, Holm L, Ekström M, Fuerst E, Prättälä R, editors. *Regulating markets - regulating people: on food and nutrition policy*. Oslo: Novum Press, 1993:185-204.
- 10 Grignon C, Grignon C. Long-term trends in food consumption: a French portrait. *Food Foodways* 1999;8(3):151-74.
- 11 Bourdieu P. *Distinction: a social critique of the judgement of taste*. London: Routledge & Kegan Paul, 1989.
- 12 Prättälä R, Berg M-A, Puska P. Diminishing or increasing contrasts? Social class variation in Finnish food consumption patterns 1979-1990. *Eur J Clin Nutr* 1992;42(Suppl):16-20.
- 13 Roos E, Prättälä R, Lahelma E, Kleemola P, Pietinen P. Modern and healthy? Socioeconomic differences in the quality of diet. *Eur J Clin Nutr* 1996;50:753-60.
- 14 National Research Council (US) Subcommittee on the Tenth Edition of the RDAs. *Recommended dietary allowances*. 10th edn. Washington, DC: National Academy Press, 1989.
- 15 Hu FB, Stampfer MJ, Manson JE, et al. Dietary saturated fats and their food sources in relation to the risk of coronary heart disease in women. *Am J Clin Nutr* 2000;70:1001-8.
- 16 Lopez-Azpiroz I, Johansson L, Petkeviciene J, Prättälä R, Martínez-González MA. Disparities in food habits in Europe: systematic review of differences in the intake of fat. 2002;unpublished manuscript.
- 17 Hupkens C, Knibbe R, Drop M. Social class differences in food consumption: the explanatory value of permissiveness and health and cost considerations. *Eur J Public Health* 2000;10:108-13.
- 18 Roos G, Prättälä R, FAIR-97-3096 Disparities group (tasks 4 and 5). Disparities in food habits: review of research in 15 European countries. Publications of the National Public Health Institute B24/1999. Helsinki: National Public Health Institute; 1999.
- 19 National Nutrition Council. *NORKOST 1993-94*. Oslo: The Council, 1997.
- 20 Kleemola P, Roos E, Pietinen P. Suomalaisen ravinnon muutokset eri koulutusryhmissä vuodesta 1982 vuoteen 1992 (Changes in Finnish diet in different educational groups between 1982 and 1992). *Sosiaalilääketieteellinen Aikauslehti* 1996;33:9-16.
- 21 Haraldsdottir J, Holm L, Hojmark Jensen J, Møller A. *Danskernes kostvaner 1985*. 2. Hvem spiser hvad? (Food habits in

Denmark 1985. 2. Who eats what?). Copenhagen: Levnedsmiddelstyrelsen, 1987.

22 Gregory J, Foster K, Tyler H, Wiseman M. The dietary and nutritional survey of British adults: a survey of the dietary behaviour, nutritional status and blood pressure of adults aged 16 to 64 living in Great Britain. London: HM Stationary Office, 1990.

23 Kübler W, Anders H, Heesch W, Kohlmeier M, editors. VERA-Schriftenreihe (Verbundstudie Ernährungserhebung - Risikofaktoren Analytik) (VERA series. Joint nutritional survey - analysis of risk factors). Langgong-Niederkleen: Wissenschaftlicher Fachverlag Dr. Fleck, 1992.

24 Kussmaul B, Döring A, Stender M, Winkler G, Keil U. Zusammenhang zwischen Ernährungsverhalten und Bildungsstand: Ergebnisse der Ernährungserhebung 1984/85 des MONICA-Projektes Augsburg (Correlation between dietary behaviour and educational attainment: results of the 1984/85 nutrition survey of the Augsburg MONICA Project). Z Ernährungswiss 1995;34:177-82.

25 Encuesta de nutrición de la Comunidad Autónoma del País Vasco. Tendencias de consumo alimenticio: indicadores bioquímicos y estado nutricional de la población adulta (Nutritional survey of the Basque Country. Food consumption trends: biochemical markers and nutritional status of the adult population). Vitoria: Gobierno Vasco, Departamento de Sanidad, Servicio Central de Publicaciones del Gobierno Vasco, 1994.

26 Moreno-Sueskun I. Hábitos alimentarios de la población Navarra 1989-1990 (Food habits in the Navarra population). Pamplona: Gobierno de Navarra, Departamento de Salud. Fondo de Publicaciones del Gobierno de Navarra, 1993.

27 MAFF. The National Food Survey 1985: Household food consumption and expenditure. London: HM Stationary Office, 1986.

28 MAFF. The National Food Survey 1986: Household food consumption and expenditure. London: HM Stationary Office, 1987.

29 MAFF. The National Food Survey 1987: Household food consumption and expenditure. London: HM Stationary Office, 1988.

30 MAFF. The National Food Survey 1988: Household food consumption and expenditure. London: HM Stationary Office, 1989.

31 Trichopoulou A, Lagiou P, editors. Methodology for the exploitation of HBS food data and results on food availability in

5 European countries. DAFNE I. Luxembourg: European Commission (COST Action 99), 1997.

32 Moreiras O, Carbajal A, Campo M. Tendencias de los hábitos alimentarios y estado nutricional en España: resultados de las encuestas de presupuestos familiares. Actas del 1º congreso de la Sociedad Española de Nutrición Comunitaria 1994; Octubre 24-25, Barcelona. (Food habit trends and nutritional status in Spain: results of the Household Budget Surveys. 1st Congress of the Spanish Society of Community Nutrition 1994; October 24-25). Barcelona: Sociedad Española de Nutrición Comunitaria, 1994.

33 Trichopoulou A, Lagiou P, editors. Methodology for the exploitation of HBS food data and results on food availability in 6 European countries. DAFNE II. Luxembourg: European Commission, 1998.

34 Lahelma E, Rahkonen O, Huuhka M. Changes in the social patterning of health? The case of Finland 1986-1994. Soc Sci Med 1997;44(6):789-99.

35 Cooper H. Synthesizing research: a guide for literature reviews. third edn. Thousand Oaks: Sage Publications, 1998.

36 FAO. FAOSTAT nutrition data: Food Balance Sheets. 1999. (Available at: <http://apps.fao.org/cgi-bin/nph-db.pl?subset=nutrition>)

37 Blundell JE. What foods do people habitually eat? A dilemma for nutrition, an enigma for psychology. Am J Clin Nutr 2000;71:3-5.

38 Goris AHC, Westerterp-Plantenga MS, Westerterp KR. Undereating and underreporting of habitual food intake in obese men: selective underreporting of fat intake. Am J Clin Nutr 2000;71:130-4.

39 Macdiarmid J, Blundell J. Assessing dietary intake: who, what and why of underreporting. Nutr Res Rev 1998;11:231-53.

40 Kelly A, Becker W. Food balance sheets. In: Becker W, Helsing E, editors. Food and health data: their use in policy making. WHO Regional Publications European Series No. 34. Copenhagen: WHO Regional Office for Europe, 1991:39-48.

41 Becker W, Enghardt H. Utveckling av livsmedelskonsumtionen i Norden 1965-1990 (Food consumption in the Nordic countries 1965-1990). Scand J Nutr 1993;37:118-24.

Received 20 September 2001, accepted 15 April 2002