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Validation of a short qualitative food frequency list used in several German large scale surveys

Validierung einer kurzen qualitativen Food Frequency Liste aus verschiedenen deutschen Querschnittsstudien

Summary Our study aimed to test the validity of a short, qualitative food frequency list (FFL) used in several German large scale surveys. In the surveys of the MONICA project Augsburg, the FFL was used in randomly selected adults. In 1984/85, a dietary survey with 7-day records (DR) was conducted within the subsample of men aged 45 to 64 (response 70 %). The 899 DR were used to validate the FFL. Mean weekly food intake frequency and mean daily food intake were compared and Spearman rank order correlation coefficients and

classification into tertiles with values of the statistic Kappa were calculated. Spearman correlations range between 0.15 for the item "Other sweets (candies, compote)" and 0.60 for the items "Curds, yoghurt, sour milk", "Milk including butter milk" and "Mineral water"; values for statistic Kappa vary between 0.04 ("White bread, brown bread, crispbread") and 0.41 ("Flaked oats, muesli, cornflakes" and "milk including butter milk"). With the exception of two items, FFL data can be used for analysis on group level. Analysis on individual level should be done with caution. It seems, as if some food groups are generally easier to ask for in FFL than others.

Zusammenfassung Unsere Studie hatte zum Ziel, die Validität einer kurzen, qualitativen Food-Frequency-Liste (FFL) zu untersuchen, die bereits in mehreren großen deutschen Querschnittsstudien eingesetzt wurde. In den Querschnittsstudien des MONICA Projektes Augsburg wurde die FFL bei zufällig ausgewählten Erwachsenen abgefragt. Ergänzend wurde 1984/85 an der Substichprobe der 45- bis 64-jährigen Männer eine Ernährungserhebung mittels 7-Tage-Ernährungsprotokollen (DR) durchgeführt (Beteiligung 70 %). Sie dienen hier als Referenzmethode, d.h. die Validität der FFL wurde anhand dieser

899 DR getestet. Die mittleren wöchentlichen Verzehrshäufigkeiten und der mittlere tägliche Lebensmittelverzehr wurden verglichen; zusätzlich wurden die Spearman-Rang-Korrelationskoeffizienten, die Zuordnung in Tertilen und die Statistik Kappa berechnet. Die Korrelationskoeffizienten liegen zwischen 0,15 für „Sonstige Süßwaren (Bonbons, Kompotte u.ä.)“ und 0,60 für „Quark, Joghurt, Dickmilch“, „Milch einschl. Buttermilch“ und „Mineralwasser“; die Werte für die Statistik Kappa variieren zwischen 0,04 („Weißbrot, Mischbrot, Toastbrot“) und 0,41 („Haferflocken, Müsli, Cornflakes“ und „Milch einschl. Buttermilch“). Von den 24 Items der untersuchten FFL können 22 für Auswertungen auf Gruppenebene verwendet werden, Analysen auf Individualebene sind mit Vorsicht durchzuführen. Vergleiche mit anderen Validierungsstudien deuten darauf hin, daß sich möglicherweise einige Lebensmittelgruppen generell besser als andere über Food-Frequency-Methoden erheben lassen.

Key words Food frequency questionnaire – weighed dietary records – validity – food intake measurement – MONICA

Schlüsselwörter Food-frequency-Fragebogen – Wiegeprotokolle – Validität – Ernährungserhebungen – MONICA

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Introduction

Over the last 10 years, the need to validate instruments for dietary assessment in order to use tools and interpret results adequately has become widely accepted in nutritional epidemiology (13).

A short, qualitative food frequency list (FFL) was used in the three large scale surveys of the MONICA project Augsburg in 1984/85, 1989/90, and 1994/95 with the main aim to roughly monitor trends in food intake frequency. The validation of this FFL, relative to weighed 7-day dietary records (DR) is presented here.

Similar or comparable FFL were used in other German surveys (e.g., in the National Food Consumption Study NVS (17) and in the surveys of the German Cardiovascular Prevention Study GCP (8)) and some of their data sets recently became public use files. To our knowledge, however, supplementing data on the validity of the FFL are not yet available. FFL data from the public use files are increasingly included into diverse investigations (e.g., 4) and it might be helpful for researchers, if our results on the validity of the instrument could be taken into account.

Summarizing, the aim of the present study was to test the validity of the FFL as compared to weighed 7-day dietary records.

Methods

Study design

In the MONICA project Augsburg, the FFL was first employed in the risk factor survey of 1984/85 with a randomly selected sample of 5 069 eligible men and women aged 25–64 years. As part of this main survey, an additional dietary survey by weighed 7-day records was carried out in the subsample of the 1 284 eligible men aged 45–64 years. Details of both the risk factor survey and the dietary survey have already been published elsewhere (12, 20, 22). The DR from the subsample were used for reference to retrospectively test the relative validity of the FFL.

Subjects

For the first MONICA risk factor survey in 1984/85, an age- and sex-stratified two-stage cluster sample of the population aged 25–64 years was drawn from the population registers of the city of Augsburg and of the communities of the two surrounding counties (6). In the subsample of men aged 45–64 years relevant for the validation, 1 328 subjects were sampled, 1 284 were eligible, from these men 1 074 took part in the study (re-

sponse 83.3 % among the eligibles), and 1 069 fully completed the FFL.

Each of the 1 074 study participants was to have taken part in the additional dietary survey by DR. However, 175 men refused before, during or after the introduction; 901 men brought back complete records out of which 899 could be accepted (response 70.0 % among the eligibles).

As two men did not answer all FFL items correctly, the final number of men included into the analysis varies between 897 and 899 for the different food items.

The examination period was October 1984 to May 1985 for both the FFL and the DR.

Food frequency list (test method)

The FFL was part of a standardized interview. It consisted of 24 food items and asked subjects to recall their “average intake” without specifying a time frame in the following six frequency categories (= categories 6 to 1): almost daily, several times per week, about once a week, several times per month, once a month or less, never (see Appendix). Missing data for the complete FFL or for single items was rare. According to estimations of the interviewers, the FFL took distinctly less than 5 min. (Intakes of other food groups such as alcoholic beverages, coffee and spreads were asked separately in the interview and are not part of the present validation.)

The interview with the FFL was always asked before the men knew about the DR survey.

Weighed 7-day records (reference method)

Intake was assessed by open-ended, weighed 7-day records with a combination of weighing with dietary scales and measuring with household measures. Participants were individually instructed in record keeping and contacted on the 2nd and 5th day by telephone by trained nutritionists. Returned records were checked. The German national database called Bundeslebensmittelschlüssel BLS, version 2.1 was used for coding (for details see 21).

Calculation of comparable food groups

Foods from the DR were grouped as shown in the FFL. Recipes were not split into ingredients but grouped according to their main component. Finally, the food groups contained between one item (“*Mineral water*”) and 251 items (“*Meat, without sausages*”) from the DR; 566 of a total of 2 090 coded items in the DR did not fit in any group. Examples are sweet main dishes, soups, dumplings, spices, mustard, etc., as well as spread fats and coffee, tea, and alcoholic beverages, which were not part of the FFL but asked separately.

Statistics

The validity of the FFL relative to the reference method was assessed on both a group and an individual level. Differences in mean weekly food intake frequency and mean daily food intake were calculated from the DR and compared by Kruskal-Wallis-tests for men in the different FFL categories. Men in categories 6 and 5 or 3, 2, and 1 had to be combined for some items, because the number of subjects in the single cells was too small.

On the individual level, the validity of the FFQ in correctly ranking subjects was assessed by Spearman rank order correlation coefficients and by the degree of classification into the same, the adjacent or extreme tertile category, supplemented by the value of the statistic Kappa. Tertile categories for frequency of intake were calculated as follows:

- Highest tertile category:
FFL category 6; Intake on ≥ 5 d from the DR
- Medium tertile category:
FFL categories 5, 4, and 3; Intake on 1–4 d from the DR
- Lowest tertile category:
FFL categories 2, and 1; Intake on 0 d from the DR

Additionally, we calculated the degree of classification into higher and lower tertile categories (results not shown separately), applied the McNemar test of symmetry for the comparison, and defined over- or underestimation for tertile classification as follows:

- Strong over- or underestimation: Difference between percentage of men classified into the higher and the lower tertile by FFL as compared to the DR is ≥ 25 %.
- Over- or underestimation: Difference between percentage of men classified into the higher and the lower tertile by FFL as compared to the DR is between 2 and 25 %.
- Agreement: Difference between percentage of men classified into the higher and the lower tertile by FFL as compared to the DR is ≤ 2 %.

Results

Agreement in group results

Mean weekly food intake frequency and mean daily food intake from the DR for men in the different frequency categories from the FFL are presented in Table 1.

The mean weekly food intake frequencies from the DR decline nearly continuously from the higher to the lower FFL categories for most items. Exceptions with discontinuous declines are “Whole grain bread, black bread, crispbread” with subjects in FFL category 3 reporting a food intake frequency of 0.3 times/week and subjects in FFL category 2 reporting 0.5 times/week, “Other sweets (candies, compote)”, and “Fruit juices, other soft drinks (lemonade, cola-beverages, and

others)”. It must be noted that a mean daily intake frequency over 5 times/week from the DR for men in the highest FFL category (= nearly daily) is found for three items only, (“Sausages, ham”, “Cakes, pastries, biscuits”, and “Whole grain bread, black bread, crispbread”). In category 1 (= never), a mean intake frequency of 0.0 times/week from the DR is seen only for “Flaked oats, muesli, cornflakes”.

The mean daily food intakes from the DR for men in the different FFL categories show a rather similar picture of continuously decreasing intakes from the highest to the lowest category for nearly all items. Again, “Whole grain bread, black bread, crispbread” is an exception with subjects in FFL category 1 reporting a mean daily intake of 131 g and subjects in FFL category 2 reporting 118 g, as well as the items “Pasta” and “Cheese” with some negligibly small discontinuities. For a number of items, as for instance “Fresh fruit”, “Milk including butter milk” or “Mineral water”, differences between the highest and the lowest category are marked; for others, however, the total differences range within 10 g.

Agreement in individual results

Measures for agreement of both instruments in ranking subjects are presented in Table 2.

Spearman correlations between the FFL and the DR vary between 0.15 for “Other sweets (candies, compote)” and 0.60 for “Curds, yoghurt, sour milk”, “Milk including butter milk”, and “Mineral water”. Ten items of the 24 yielded values > 0.4 and 14 > 0.3 . Additionally, the food based results (Spearman rank correlation coefficients) from validation studies of dietary assessment instruments in German language are compared in Table 3.

The proportion of men classified into the same tertile category by both instruments ranges from 38.5 % for “Whole grain bread, black bread, crispbread” to 85.0 % for “Diet lemonade, other diet beverages” (Table 2). The classification into adjacent tertile categories ranges from 11.9 % for “Diet lemonade, other diet beverages” to 43.9 % for “Salad or vegetable, raw” and complete misclassification into the opposite tertile category varies between 0.1 % for three items (“Poultry”, “Rice”, and “Salted snacks such as salted peanuts, crisps, and others”) and 25.1 % for “Whole grain bread, black bread, crispbread”. The values of the statistic Kappa lie between 0.04 for “White bread, brown bread, toast bread” and 0.41 for the two items, “Flaked oats, muesli, cornflakes” and “milk including butter milk”, with all other 22 values > 0.4 .

Concerning tertile category classification, the FFL shows a tendency towards overestimation with 11 items being slightly and five items being strongly overestimated. Two items were slightly and five items strongly underestimated (Table 2).

Table 1 Agreement in group results between the MONICA food frequency list and 7-day records in 899 men from Augsburg aged 45–64 years: Mean weekly food use frequency (in times/week) and mean daily food intake (in g/d) from the records for men in the different food frequency categories¹ according to the food frequency list

Foods	Mean weekly food intake frequency for men in different food frequency categories (times/week)						Mean daily food intake for men in different food frequency categories (g/d)					
	6	5	4	3	2	1	6	5	4	3	2	1
Meat (without sausages)	4.2	3.7	2.9		1.7 ²⁾		123	98	75		48 ²⁾	
Sausages, ham	5.9	5.4	4.6		3.1 ²⁾		130	110	89		59 ²⁾	
Poultry		1.0 ³⁾	0.6	0.6	0.4	0.2		34 ³⁾	22	20	13	7
Fish		1.5 ³⁾	1.0	0.9	0.6	0.3		31 ³⁾	23	21	12	7
Potatoes	3.8	3.4	2.8		2.4 ²⁾		106	92	76		56 ²⁾	
Pasta	1.7	1.7	1.3	1.1	0.8	0.7	38	40	30	28	15	13
Rice		0.8 ³⁾	0.6	0.5	0.3	0.1		19 ³⁾	15	11	6	2
Salad or vegetable, raw	3.6	3.0	2.8		2.1 ²⁾		56	43	43		32 ²⁾	
Vegetable, cooked	3.4	3.2	2.7		2.3 ²⁾		82	73	57		52 ²⁾	
Fresh fruit	3.7	2.1	1.3	1.3	0.8	0.3	123	56	33	28	21	7
Chocolate, chocolates	2.0	1.2	0.7	0.6	0.3	0.1	12	7	4	3	2	0
Cakes, pastries, biscuits	5.2	4.5	3.3	3.0	1.8	1.2	128	101	73	57	34	19
Other sweets (candys, compote)	0.6	0.8	0.7	0.9	0.6	0.4	5	9	8	11	5	5
Salted snacks such as salted peanuts, crisps, and others		0.7 ³⁾	0.3	0.3	0.1	0.1		5 ³⁾	3	2	1	0
White bread, brown bread, toast bread	6.6	6.5	6.4	6.1	5.9	5.9	156	151	143	141	118	131
Whole grain bread, black bread, crispbread	1.8	1.3	0.4	0.3	0.5	0.1	23	14	4	3	6	1
Flaked oats, muesli, cornflakes	3.2	0.8	0.3	0.3	0.1	0.0	32	9	4	1	1	0
Curd, yoghurt, sour milk	3.7	1.5	0.7	0.6	0.3	0.2	76	31	17	13	6	4
Cheese	4.2	2.7	1.6	1.6	0.3	0.3	34	24	15	15	3	4
Eggs	4.9	2.4	1.8	1.6	1.3	1.0	62	32	22	19	15	9
Milk including buttermilk	4.6	2.4	1.5	1.1	0.8	0.6	232	101	46	31	15	12
Fruit juices, other soft drinks (lemonade, cola-beverages, and others)	3.4	2.4	1.7	1.4	0.9	1.1	226	146	85	62	37	41
Mineral water	3.2	1.4	1.0	0.7	0.3	0.2	272	76	52	30	18	8
Diet lemonades, other diet beverages	2.5	1.2	0.9		0.2 ²⁾		237	61	59		8 ²⁾	

$p \leq 0.0001$ for all foods; ¹⁾6 = nearly daily; 5 = several times per week; 4 = about once per week; 3 = several times per month; 2 = once per month; 1 = never; ²⁾Mean daily food intake from the records for men in category 4, 5, and 6, together because of too few men in single cells; ³⁾Mean daily food intake from the records for men in category 1 and 2 together, because of too few men in single cells

Discussion

In the framework of the MONICA project Augsburg, the present study tested the validity of a short, qualitative FFL relative to DR in order to decide for which kinds of analysis the FFL data could be accepted. Since comparable data of other large scale surveys became part of public use files in Germany, the validity of the instrument should be generally accessible.

The dietary survey by DR was originally not designed as reference for a validation, which is the strength of our investigation as compared to most other validation studies: The sample is large and randomly selected with ordinarily instead of highly motivated subjects. Much effort was undertaken to minimize biases inherent in the methods by strictly applying quality standard controls in data collection and coding throughout both surveys (24). On the other hand, however, weaknesses also arise from the study design: Even if DR fulfill all criteria of a good reference method for a FFL, since they are a common method of general acceptance with main sources of error being independent of the main sources of error of a FFL (3), multiple records which better account for the vari-

ability of intake instead of continuous 7-day records might have been chosen. Furthermore, the DR sample was restricted to middle-aged men, only. Generally little is yet known about the transferability of such results to other gender and age groups. The major disadvantage, however, was that for reasons of internal comparison over time the retrospective approach did not allow any improvement of the FFL in the later MONICA surveys.

In our opinion, the agreement of both instruments in group results is sufficient for most FFL items to use them for different kinds of analysis, such as calculations of mean monthly intake frequencies (19) or of a rough diet quality index (23) for groups of subjects. The two items, “Other sweets (candies and compotes)” and “White bread, brown bread, toast bread”, however, cannot be recommended for use in any analysis, even on the group level.

Concerning individual results, Spearman correlation coefficients between the FFL and the DR show values between 0.15 and 0.60 with a majority > 0.3. The limited number of validation studies of food frequency questionnaires which also included results on food level yielded comparable correlations, most of the values lying be-

Table 2 Agreement in individual results between the MONICA food frequency list and 7-day records in 898 men from Augsburg aged 45–64 years: Spearman correlation coefficients, classification into tertiles with value of statistic kappa, and over- or underestimation

Foods	Correlation coefficients ¹	Same tertile (%)	Classification into tertiles		Value of statistic kappa	Over-/under-estimation ²
			Adjacent tertile (%)	Extreme tertile (%)		
Meat (without sausages)	0.25	61.4	38.2	0.4	0.20	+
Sausages, ham	0.31	62.1	37.3	0.7	0.20	--
Poultry	0.24	58.1	41.8	0.1	0.17	+
Fish	0.29	62.1	37.6	0.3	0.23	o
Potatoes	0.23	64.1	35.6	0.3	0.12	o
Pasta	0.24	68.2	30.3	1.6	0.10	+
Rice	0.33	59.0	40.9	0.1	0.25	++
Salad or vegetable, raw	0.24	53.6	43.9	2.4	0.13	+
Vegetable, cooked	0.21	67.0	28.9	1.1	0.09	–
Fresh fruit	0.49	48.8	43.4	7.8	0.22	++
Chocolate, chocolates	0.42	62.6	35.7	1.7	0.28	+
Cakes, pastries, biscuits	0.53	54.8	43.6	15.6	0.22	--
Other sweets (candys, compote)	0.15	56.8	38.5	4.7	0.16	+
Salted snacks such as salted peanuts, crisps, and others	0.25	73.1	26.8	0.1	0.18	+
White bread, brown bread, toast bread	0.16	46.7	38.7	14.5	0.04	--
Whole grain bread, black bread, crispbread	0.34	38.5	36.4	25.1	0.15	++
Flaked oats, muesli, cornflakes	0.53	84.4	14.0	1.6	0.41	+
Curds, yoghurt, sour milk	0.60	60.0	37.2	2.9	0.35	++
Cheese	0.48	68.3	31.3	0.4	0.27	+
Eggs	0.37	66.9	32.6	0.6	0.19	–
Milk including buttermilk	0.60	63.1	32.8	4.1	0.41	o
Fruit juices, other soft drinks (lemonade, cola-beverages, and others)	0.43	50.4	42.6	7.0	0.24	+
Mineral water	0.60	51.7	39.6	8.7	0.30	++
Diet lemonades, other diet beverages	0.43	85.0	11.9	3.1	0.34	+

¹All correlation coefficients significantly different from 0 ($p \leq 0.0001$); ²Strong over- or underestimation (++/--): Difference between percentage of men classified into the higher and the lower tertile by FFL as compared to the DR is $> 25\%$. Over- or underestimation (+/-): Difference between percentage of men classified into the higher and the lower tertile by FFL as compared to the DR is between 2 and 25 %. Agreement (o): Difference between percentage of men classified into the higher and the lower tertile by FFL as compared to the DR is $\leq 2\%$

tween 0.3 and 0.6 (5, 7, 9–11, 14–16, 18). To date, there is no recommendation in this context which values are acceptable. Baranowski et al. (1) for instance seem to regard correlations below 0.3 as “low”. If the FFL should be used to rank subjects in one case or another, we recommend to decide with caution on the basis of our correlations in combination with the results of the (mis-) classification into our tertile categories and the values of the statistic Kappa which items will be used, how they should be treated statistically, and how they should be interpreted. Some findings of over- or underestimation in tertile category classification confirm the assumption that foods with a “healthy” image might tend to be overestimated (“*Fresh fruit*”, “*Whole grain bread, black bread, crispbread*”), while foods with an “unhealthy” image are probably underestimated (“*Sausages, ham*”, “*Cakes, pastries, biscuits*”, “*White bread, brown bread, toast bread*”).

Astonishingly, the comparison with results from other validation studies of dietary instruments in the German

language (2, 5; see Table 3) shows that the simple, qualitative FFL yields Spearman correlation coefficients in the same dimension for some food groups (eggs, fish, cakes and biscuits, milk and dairy products, as well as nonalcoholic beverages) than the more sophisticated quantitative instruments, which are designed not only to monitor food intakes but also to estimate the intakes of various nutrients. One out of a variety of reasons might be that cakes and biscuits, as well as milk and dairy products are often eaten as a snack or as a distinctly separate food in the course of a meal, and it seems as if these food groups are easy to remember and to describe exactly, independent from the way they are asked. This comparison points out that food frequency questionnaires might in general be of varying adequacy for different food groups.

Finally, our results indicate a number of weaknesses in the FFL which could be easily improved¹, for example: The worse performing item “*Other sweets (candies, compote)*” as well as the two items asking for bread should

Table 3 Comparison of published validation studies of dietary assessment questionnaires in German language in adults. Spearman correlation coefficients for selected foods and food groups

Foods/food groups	Spearman correlation coefficients		Present study
	Study by Beer-Borst & Amado 1995 ¹⁾	Study by Bohlscheid-Thomas et al. 1997 ²⁾	
Meat, sausages, fish, eggs	0.14		
– Meat		0.53	0.25
– Processed meat, meat products		0.57	0.31
– Eggs		0.41	0.37
– Fish		0.21	0.29
Cereal products	0.34		
– Bread		0.51	
White bread, brown bread, toast bread			0.16
Whole grain bread, black bread, crispbread			0.34
– Cereals		0.42	
Flaked oats, muesli, cornflakes			0.53
– Cakes, pastries, biscuits		0.56	0.53
Vegetables/lettuce, potatoes	0.35		
– Vegetables		0.34	
Salad or vegetable, raw			0.24
Vegetable, cooked			0.21
– Legumes		0.14	
– Potatoes		0.37	0.23
Fruits, fruit products	0.42		
– Fruit		0.50	0.49
Milk, dairy products, cheese	0.53		
– Milk, dairy products		0.56	
Curds, yoghurt, sour milk			0.60
Milk including buttermilk			0.60
– Cheese		0.47	0.48
Sweet spreads, desserts, snacks, nuts	0.24		
– Sweets		0.53	
Chocolate, chocolates			0.42
Other sweets (candys, compote)			0.15
– Salty snacks		0.32	0.25
– Nuts, seeds		0.18	
Nonalcoholic drinks	0.37		
– Soft drinks		0.67	
Fruit juices, other soft drinks (lemonade, cola-beverages, and others)			0.43
Mineral water			0.60
Diet lemonades, other diet beverages			0.43

¹⁾in 41 men aged 19–55 years in Zürich, Switzerland 24-hour recall questionnaire vs. a reference of 3-day records;

²⁾in 104 persons aged 35–64 years in Heidelberg, Germany EPIC food frequency questionnaire vs. a reference of 12 24-hour recalls

be modified in content (candies and compote do not fit together either in common sense or in any food grouping system) or wording (brown bread and black bread means the same in the surveyed population but not in various other regions in Germany). The frequency scale does not distinguish unambiguously between categories ("Nearly daily" vs. "Several times per week"; "About once per week" vs. "Several times per month"). At least the further category "Several times per day" in the frequency scale would be very useful for a number of usually daily consumed items. Also the initial question could better relate to a specified time frame, as for example "the last year".

Conclusion

For the MONICA project Augsburg, the FFL in its original version (supplemented by a few new items in the 2nd and 3rd survey) was in the meantime used with over 14 000 subjects. To assure comparability, it could unfortunately not be modified retrospectively. From the present validation, however, we cautiously concluded that most

items of the FFL can be used to describe food intake frequencies in 1984/85, 1989/90, and 1994/95 in different gender and age groups, to monitor trends in most items (19), and to calculate and monitor a diet quality index (23), even if generally the knowledge about the transferability of such validations from men to women, to different age groups and to different periods of time is very limited.

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¹A number of these suggestions are already realized in the FFLs used in the NVS, in the GCP, and in the German Health Survey 1997/98.

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Appendix 1 MONICA Augsburg food frequency list – original wording in the German language¹ and English translation

Eingangsfrage

Wie häufig nehmen Sie die folgenden Nahrungsmittel zu sich?

Kategorien der Verzehrshäufigkeit

Fast täglich
Mehrals in der Woche
Etwa einmal in der Woche
Mehrals im Monat
Einmal im Monat oder seltener
Nie

Lebensmittel und Getränke

Fleisch (ohne Wurstwaren)
Wurstwaren, Schinken
Geflügel
Fisch
Kartoffeln
Teigwaren
Reis
Salat oder Gemüse, roh zubereitet
Gemüse, gekocht
Frisches Obst
Schokolade, Pralinen
Kuchen, Gebäck, Kekse
Sonstige Süßwaren (Bonbons, Kompotte u.ä.)
Salzige Knabbereien wie gesalzene Erdnüsse, Crisps etc.
Weißbrot, Mischbrot, Toastbrot
Vollkornbrot, Schwarzbrot, Knäckebrötchen
Haferflocken, Müsli, Cornflakes
Quark, Joghurt, Dickmilch
Käse
Eier
Milch einschl. Buttermilch
Obstsäfte, sonstige Erfrischungsgetränke (Limonade, Cola-Getränke u.ä.)
Mineralwasser
Diätlimonaden, sonst. Diätgetränke

Question

How often do you eat the following foods?

Frequency categories

Nearly daily
Several times per week
About once per week
Several times per month
Once per month or less
Never

Foods and beverages

Meat (without sausages)
Sausages, ham
Poultry
Fish
Potatoes
Pasta
Rice
Salad or vegetable, raw
Vegetable, cooked
Fresh fruit
Chocolate, chocolates
Cakes, pastries, biscuits
Other sweets (candys, compote)
Salted snacks, such as salted peanuts, crisps, and others
White bread, brown bread, toast bread
Whole grain bread, black bread, crispbread
Flaked oats, muesli, cornflakes
Curds, yoghurt, sour milk
Cheese
Eggs
Milk including buttermilk
Fruit juices, other soft drinks (lemonade, cola-beverages, and others)
Mineral water
Diet lemonades, other diet beverages

¹For MONICA food frequency list in German language in original layout see Winkler G, Döring A (1995) Kurzmethoden zur Charakterisierung des Ernährungsmusters: Einsatz und Auswertung eines Food-Frequency-Fragebogens. *Ernährungs-Umschau* 42:289–291