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Abbreviations

BMI	…	Body Mass Index
FFQ	…	Food Frequency Questionnaire
ISCED	…	International Standard Classification of Education
SD	…	Standard Deviation
WHO	…	World Health Organization
WFR	…	Weighed Food Record

1 Introduction

Long term effects of diet on the development of chronic disease have already been recognized, so food intake and dietary behavior are essential factors in the generation of health and disease. The attempt to preemptively discover the causes of serious long term diseases as well as facilitate health promotion has resulted in the contemporary development of dietary assessment methods [Shahar et. al., 2003]. The nutritional status of an individual or of a whole population can be evaluated through many different modes of analysis. Depending on the questions and the intention of the study a combination of both culturally and naturally constructed methodologies may be used [Elmadfa et. al., 2009].

The trajectory of this thesis is to develop a tool to assess dietary food consumption and dietary pattern. Taking dietary energy intake as the main indicator a semi-quantitative food frequency questionnaire was developed and validated. The questionnaire is self-administered and typically suited for an Austrian diet. The survey is conducted over the course of 6 months with a 3 day weighed food protocol. Each study participant completes both dietary assessment methods. After the FFQ's improvements the questionnaire attempts to measure the energy intake of a person per day. The developed dietary assessment method should provide a cheap tool to give an overview of the dietary situation of the Austrian population.

An FFQ developed for the Austrian population capturing total energy intake of individuals and validated with a 3 day weighed food record using new data to generate the food list has yet not been conducted. Though similar studies might exist, the many varieties of validation study ensure that they will never overlap entirely.

In addition to the validation process personal characteristics of the study participants shall be collected to include influencing factors when assessing

dietary energy intake. The following questions shall be explored in further detail: Is there a difference in the energy intake among younger adults compared to older ones? Does the educational level or the habitation affect the energy intake? Is there an association between normal weight people with a lower energy intake and between pre- obese people with a higher energy intake?

Total dietary energy intake is a crucial concern in the Western civilization. Hence new approaches for developing good methods of looking at this specific health indicator are of the utmost significance.

2 Literature Review

2.1 Dietary Energy Intake

Total energy intake deserves special attention in nutritional epidemiology for several reasons.

- The level of total energy intake could be a determinant for various diseases.
- Total energy intake is also positively correlated with the intake of nutrients. Differences in total dietary energy intake among individuals produce a variation in the intake of specific nutrients unrelated to dietary composition behavior. Special attention is deserved by total energy intake when observing specific nutrients to eliminate false conclusions and errors.
- When energy intake is not a direct cause of a disease, but associated with it, the effects of specific nutrients may be confounded by the total energy intake [WILLETT, 1990].

2.1.1 Definition of energy units

In this paper the kcal was used to describe dietary energy intakes. It was chosen because it seems to be the most common unit of food energy used in public, described in articles, the internet or recipes [HARGROVE, 2007]. However there are other forms of energy units and it is important to understand their differences.

2.1.1.1 Joule

The international unit for energy is the Joule. 1 J (Joule) is defined as the energy needed to move 1 kg (Kilogram) with the force of 1 N (Newton) for 1 m (meter) [ELMADFA and LEITZMANN, 2004].

2.1.1.2 Calorie

“The ‘small calorie’ or ‘g-calorie’ is defined as the amount of heat required to raise the temperature of 1 g of water by 1°C with a temperature change from 14.5 to 15.5°C.” [HARGROVE, 2007].

2.1.1.3 Calorie

“The Calorie was originally defined as the amount of heat required to raise the temperature of 1 kg of water from 0 to 1°C at atmosphere of pressure. When used to express potential energy on food labels, it is defined as 4.186 kJ and is identical to a kcal.” [HARGROVE, 2007].

2.1.1.4 Kcal

After the 1930s, when the m-kg-s system was adopted, a kcal was defined as 1000 cal. The later change to the SI system in the 1950´s deemed all other forms of the calorie in science obsolete [HARGROVE, 2007].

Usually the Calorie or kcal always indicates the potential energy in foods, whereas the primary use of the joule is a unit of energy in general. However no matter what energy unit one uses all forms can be inter-converted due to the First Law of Thermodynamics [HARGROVE, 2007].

2.1.2 DACH- Reference Value

The DACH is a set of reference values that refer to data for nutrient intake published from scientific boards in Germany (Gesellschaft für Ernährung in Deutschland, DGE), Austria (Österreichische Gesellschaft für Ernährung, ÖGE) and Switzerland (Schweizerische Gesellschaft für Ernährungsforschung, SGE). There are also other reference values from similar scientific boards like the Dietary Reference Intakes (DRI) from the USA and Canada or the FAO/WHO. However in this paper mainly DACH-reference values for explanation purposes will be used [DACH, 2008].

2.1.2.1 Energy requirement

Energy requirements result from the basal metabolic rate (BMR), the physical activity level, dietary induced thermogenesis and other demands during growth, pregnancy and lactation [DACH, 2008].

The basal metabolic rate makes up most of the energy requirement, assuming common physical activity. It is strongly linked to the fat free or active body cell mass, which declines with age and is higher in men. This means men have a 10% increased basal metabolic rate than women and therefore have a higher energy requirement [DACH, 2008]. Table 1 should only give an idea of the dimensions of the BMR, excluding the specific calculations. The BMR differs when considering sex, age and bodyweight.

Table 1: Calculated Basic Metabolic Rate considering sex, age and body weight [DACH, 2008].

Age	Body Weight (kg)		Basal Metabolic Rate (kcal/d)	
	M	F	M	f
15 to under 19 years old	67	58	1820	1460
19 to under 25 years old	74	60	1820	1390
25 to under 51 years old	74	59	1740	1340
51 to under 65 years old	72	57	1580	1270
65 years old and higher	68	55	1410	1170

The physical activity level (PAL) on the other hand depends on the work performance and leisure behavior. It is expressed as a multiple of the basal metabolic rate and usually ranges between 1.2 and 2.4, depending on the specific activities throughout the day. Dietary induced thermogenesis plays a quantitatively smaller role in the overall energy requirement. The total recommended energy requirement should be illustrated in units like the mega-joule (MJ) and the kilocalorie (kcal). (1MJ=239kcal; 1kcal=4,184kJ) [DACH, 2008].

Table 2: Reference values for mean energy intake of people with different ages depending on the BMR and on the PAL [DACH, 2008].

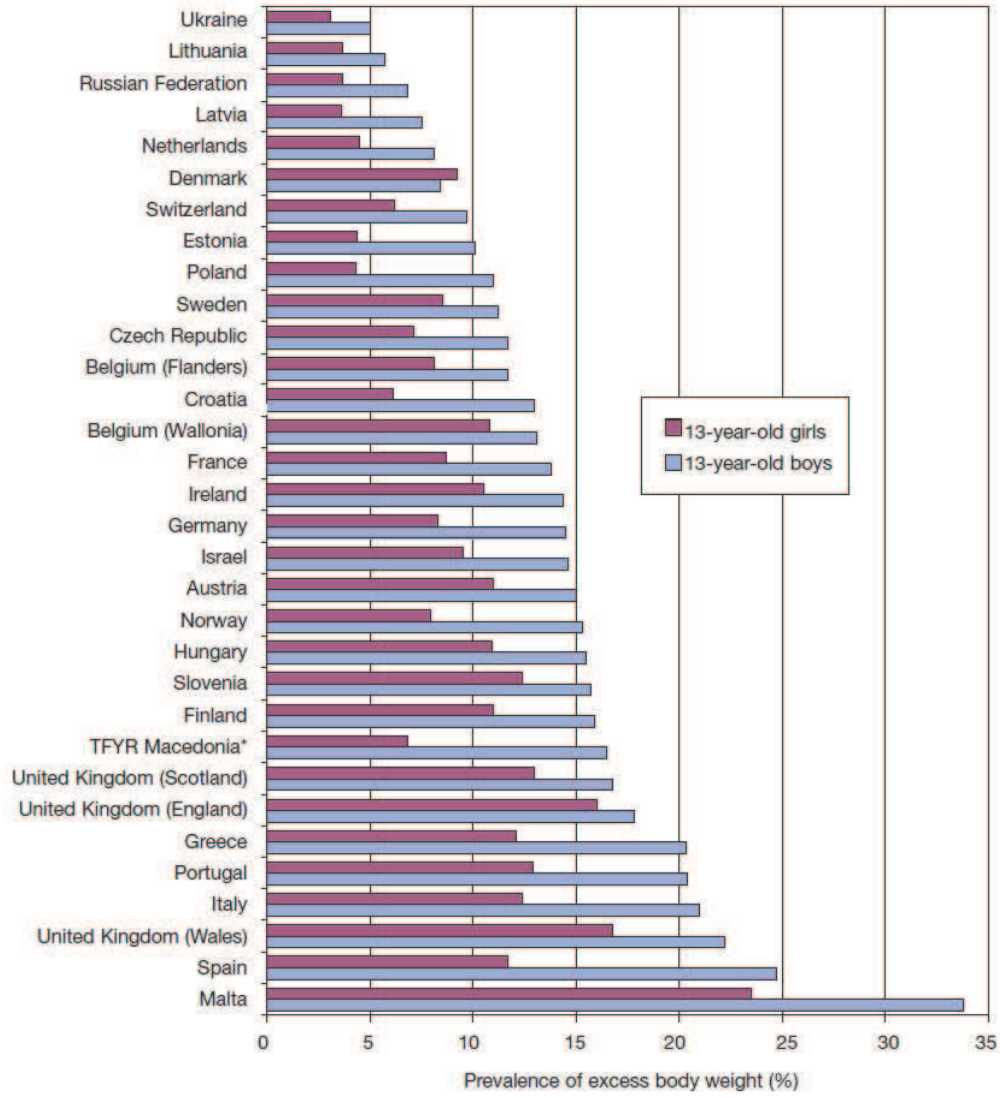
Age	BMR (kcal/d)	Physical Activity Level (PAL) (kcal/d)			
Adolescence and adults (m)		**1,4**	**1,6**	**1,8**	**2**
15 to under 19 years old	1820	2500	2900	3300	3600
19 to under 25 years old	1820	2500	2900	3300	3600
25 to under 51 years old	1740	2400	2800	3100	3500
51 to under 65 years old	1580	2200	2500	2800	3200
65 years old and higher	1410	2000	2300	2500	2800
Adolesence and adults (w)					
15 to under 19 years old	1460	2000	2300	2600	2900
19 to under 25 years old	1390	1900	2200	2500	2800
25 to under 51 years old	1340	1900	2100	2400	2700
51 to under 65 years old	1270	1800	2000	2300	2500
65 years old and higher	1170	1600	1800	2100	2300

The energy requirement depends on both lifestyle and genetic factors. On average, pregnant women need an additional 255kcal per day, and women during the first 4 months of lactation an additional 635kcal per day [DACH, 2008].

For reference purposes to classify the individual's nutritional status the Body Mass Index (BMI) is used. It is calculated by dividing the body weight (kg) by the square of the body height (m). If the long-term energy intake exceeds the energy requirement or energy turnover, it will eventually lead to obesity and an increased BMI which will cause drastic health outcomes [DACH, 2008]. For adults a BMI under 18,5 kg/m² is declared as underweight, a BMI between 18,5 and 24,9 kg/m² as normal weight, a BMI between 25,0 and 29,9 kg/m² as pre-obese and a BMI above 30,0 kg/m² as obese [ELMADFA et al., 2009a].

2.1.3 Trends Overweight/Obesity

Due to the energy intake and the energy expenditure imbalance of today's society, dietary assessments have become of greater importance. The proportion of obese people in many countries is threatening to become a global epidemic. Lifestyle factors that encourage excessive food intake and discourage physical activity only promote a trend to a dangerously overweight population [HILL and PETERS, 1998].



*TFYR Macedonia = The former Yugoslav Republic of Macedonia
Source: Health Behaviour in School-aged Children (1).

Figure 1: Prevalence of excess body weight (including obesity) among 15-year-olds in countries of the WHO European Region, 2001/2002 [WHO, 2007].

Reports from the World Health Organization claim that obesity is one of the greatest public health challenges of the 21st century. Especially alarming is the prevalence of childhood obesity. It has been growing steadily and is now ten times higher than it was in the 1970s.The WHO predicts a number of 150 million obese adults and 15 million obese children and adolescents in Europe by 2010 [WHO, 2007].

Austria ranks in the middle range of overweight adolescence within Europe. The prevalence of obese 15-year-olds ranges from 5% up to 38%, in various WHO European countries. Figure 1: Prevalence of excess body weight (including obesity) among 15-year-olds in countries of the WHO European Region, 2001/2002 gives you a quick overview of such outcomes in different countries. It also outlines that more boys tend to be obese than girls. [WHO, 2007].

The published European Nutrition and Health Report of 2009 describes similar results. In European countries the prevalence of overweighed women (19-64 years) ranges somewhere between 21-37%, the prevalence of obese women between 7-37%. For men the picture looks more drastic with 35-54% overweight and 6-36% obese adults. The highest prevalence of obesity and overweight occurs in Greek women and Cypriot men [Elmadfa et al., 2009b].

Obesity is not to be taken lightly as it can prove a great threat to health and the well-being of a society. Obesity increases the risk of many chronic diseases such as diabetes and cardiovascular disease [HILL and PETERS, 1998]. This was later discussed by the WHO and undermined with new scientific research to the same conclusion: both under-nourishment as well as over-nourishment played a role in the development of chronic disease [WHO, 2003]. Dietetic behavioral changes throughout the past decades, influenced by both qualitative and quantitative factors, have resulted in malnutrition although enough food and diversification is present on the markets in industrialized countries. This new trend is characterized by a diet increasingly high in fat and energy-dense foods, a sedentary, inactive lifestyle, and an increase in the consumption of animal

bodies [WHO, 2003]. The need to identify and overlook indicators such as energy intake seems to be crucial in order to prevent further trends towards the obesity epidemic.

Table 3: Global trend to an increased per capita food consumption [WHO, 2003].

Global and regional per capita food consumption (kcal per capita per day)

Region	1964–1966	1974–1976	1984–1986	1997–1999	2015	2030
World	2358	2435	2655	2803	2940	3050
Developing countries	2054	2152	2450	2681	2850	2980
Near East and North Africa	2290	2591	2953	3006	3090	3170
Sub-Saharan Africa[a]	2058	2079	2057	2195	2360	2540
Latin America and the Caribbean	2393	2546	2689	2824	2980	3140
East Asia	1957	2105	2559	2921	3060	3190
South Asia	2017	1986	2205	2403	2700	2900
Industrialized countries	2947	3065	3206	3380	3440	3500
Transition countries	3222	3385	3379	2906	3060	3180

[a] Excludes South Africa.

Table 3 outlines the steady increase of dietary energy intake measured in kcal per capita per day on a worldwide basis. The energy intake ranges somewhere between 2803 and 2940 kcal per day. Compared to 1964, this figure increased up to 514 kcal a day. Even in industrialized countries with enough food supply an increase of energy intake could be observed [WHO, 2003].

Obesity not only causes serious consequences for the individual, but it also contributes to 2-8% of health costs and is responsible for 10-13% of deaths in the WHO European Region [WHO, 2009]. In the United States in 1995 obesity accounted for US$ 70 billion in total health care costs. The indirect costs which are not included in this figure are much higher, and consist of workday loss, physicians visit, disability pension and premature mortality [WHO, 2003]. Combined with other lifestyle factors, declines in energy expenditure can be easily modified for health promotion and primary prevention of chronic disease [WHO, 2003].

Although global trends are problematic, trends within Austria seem a little different: The Austrian Nutrition Report 2008 has evaluated Austrian's diet and

just published its third edition with recent dietary trends [ELMADFA et al., 2009a]. The mean energy intake of the whole population was assessed to be under the desirable energy intake value. This would contradict data shown in Table 3. Although the mean energy intake of the population was under the eligible reference figure, all investigated age groups had a high percentage of overweight persons. 19% of all 6 to 15 year-old school children (thereof 8% obese), 42 % of all 18 to 65 year-old adults (thereof 11% obese) and 40% of all 65 to 84 year-old seniors were considered to be overweight. As described in Figure 1: Prevalence of excess body weight (including obesity) among 15-year-olds in countries of the WHO European Region, 2001/2002 [WHO, 2007]., the prevalence of overweight people and obese people is also higher in Austrian boys or men than in Austrian girls or women. It is interesting to note the strong east-west slope. Populations living in the east of Austria seem to have a higher prevalence of overweight people than the west of Austria [ELMADFA et al., 2009a].

Even though the energy intake lies under the advised value there is no evidence for an insufficient energy intake among the Austrian population. The lower energy intake reference values might result from an inappropriate lifestyle with a lack of exercise which could be the cause of a lower energy requirement. It should also be pointed out that the reference values were calculated based on a moderate physical activity level. This might not have been suited for the sedentary lifestyle of most subjects [ELMADFA et al., 2009a].

2.2 Nutritional assessments

2.2.1 History

Dietary or nutritional assessments were initially used to explore the nutritional status of a population on a national basis. They first were introduced at a conference held in 1932 by the Health Organization of the League of Nations [GIBSON, 1990].. However the influence of a diet on the occurrence of human diseases has concerned human thought from a much earlier time. In 1753 one of the earliest clinical trials was conducted to detect a cure for scurvy. This led

to the finding of an illness caused by a vitamin C deficiency. Later in the nineteenth century another vitamin deficiency was found to cause the illness beri-beri. Its occurrence among sailors led to the suggestion of a thiamine deficiency. Other deficiency syndromes causing Pellagra or Keshan disease are also examples of illnesses caused by malnutrition found in epidemiological studies [WILLETT, 1990].

However, contemporary nutritional epidemiologist's focus has shifted from a concern on deficiency syndromes to major chronic disease of western cultures and populations [WILLETT, 1990].

2.2.2 Nutritional status

The nutritional status represents how adequate the physiological nutrition requirement of a person or a population is covered by its food intake [ELMADFA and LEITZMANN, 2004]. The nutritional status of a person or a population can be evaluated through the following methods:

- Nutritional assessments
- Anthropometric methods
- Biochemical methods
- Clinical methods

Depending on the question asked and the aim of the study a combination of different techniques can be used [ELMADFA et al., 2009a].

2.2.3 Methodology to assess food intake

Nutritional assessment is defined as the interpretation of information obtained from dietary, biochemical, anthropometric and clinical studies [GIBSON, 1990]. The objective analysis of the nutritional status and nutritional risk factors are essential to compare regions or countries, to provide information for testing the impact of changes, to observe progress over time and have important political implications [WHO, 2006].

To assess dietary food intake several tools are available. Dietary assessment methods can generally be divided into two basic groups: those methods that

collect data at the time of consumption (prospective methods) and those methods that record data about the diet eaten in the recent past or over a longer period of time (retrospective methods) [EFSA, 2009]. Because there are so many different methods that can be used to evaluate actual food intake patterns, factors such as the measurement of past or present food intake must depend upon the questions they are used to answer [ELMADFA and LEITZMANN, 2004].

The methodology that is most appropriate and cost effective for the monitoring of food consumption is not easy to find. Each method has its advantages and disadvantages. Some key concerns before selecting a specific method are the objectives of the study; the foods or nutrients of primary interest; the need for population or individual data; the need for absolute compared to relative intake estimations; characteristics of the population like sex, education and age; the time frame of the study; the specification needed for the description of foods and the available resources [BIRÒ et. al., 2002]. Given these preconditions a variety of different methods are used in epidemiological studies to assess dietary food intake.

2.2.3.1 Present food intake

The different ways to measure present food intake include the weighed food protocol in which all consumed foods are weighed and the data recorded; the inventory methods in which food consumption of a household is registered including the waste products; the nutritional protocol similar to the weighed protocol except with foods that are not weighed but recorded as portion sizes; the book-keeping method where all consumed foods are registered without including the waste products; and finally the audiotape recording method where all eaten foods are recorded on tape [ELMADFA and LEITZMANN, 2004].

2.2.3.2 Past food intake

Different methods that measure past food intake include the 24 hour recall method where food consumption over the past 24 hour period is asked; the diet history method where dietary pattern and behavior usually over the past 3

months are evaluated; the questionnaire evaluation which can be filled out alone or together with an interviewer to describe past nutritional behavior; the food shopping list which describes foods bought during the past week within an household; and the archaeological method where food waste products of a household gives information on its food consumption [ELMADFA and LEITZMANN, 2004].

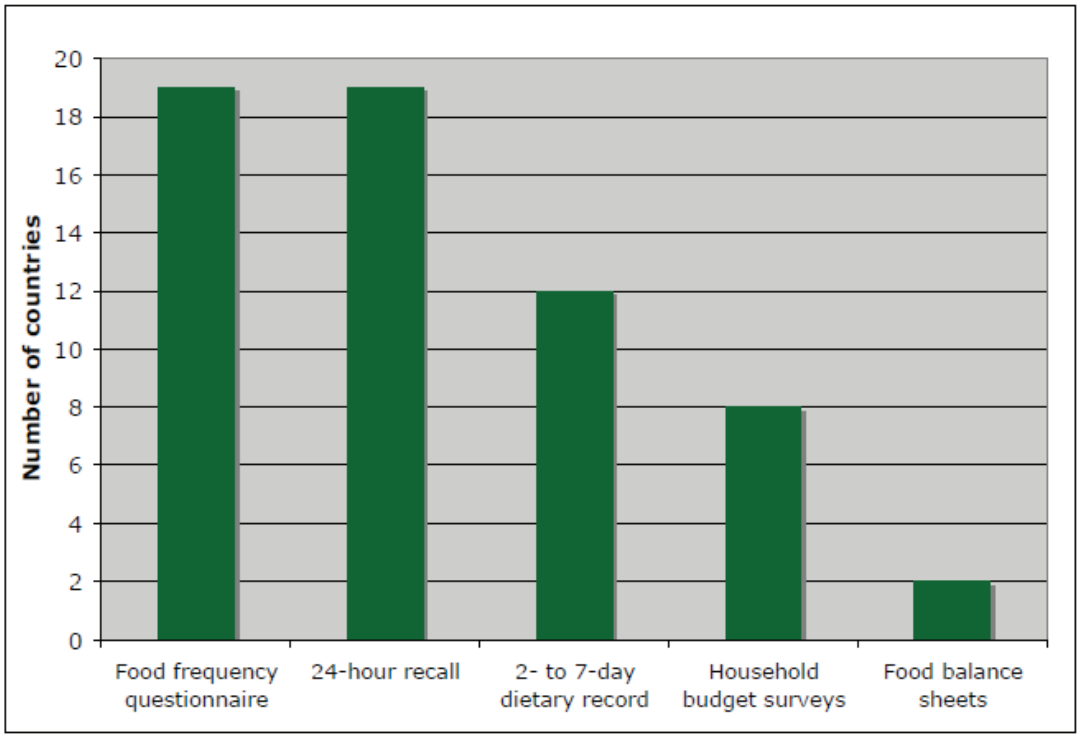


Figure 2: Methods of dietary assessment among adults in countries in the WHO (World Health Organisation) European Regions [WHO, 2006].

The WHO compared forty-three countries within the WHO European Regions. Almost all of them provided data on individual dietary intake. The dietary assessment methods for evaluating dietary intake varied between the Member States and even within countries. Most commonly the FFQ and the 24-hour recall method were used among adults [WHO, 2006].

The European Nutrition and Health Report 2009 used dietary surveys to compare food consumption of adults among 16 European countries. The main dietary assessment methods were 24-hour recalls and dietary food records

[Elmadfa et al., 2009b]. The importance to assess national data in order to compare countries seems essential for health and disease monitoring and once more highlights the need for the improvement of dietary assessment methods.

For the purpose of this paper two specific evaluation methods of food intake will be described in further detail.

2.2.4 Food frequency questionnaire (FFQ)

The food frequency questionnaire is a method to assess past food intake. It therefore is a tool to explore long-term dietary intake which includes weeks, months or years. It can be self-administered or completed with the help of an interviewer [WILLETT, 1990].

The food frequency questionnaire consists of two components: a food list which provides a limited number of foods to choose from and a frequency response where the subjects declare how often they have eaten a specific food item. The semi-quantitative food frequency questionnaire includes additional questions concerning the quantity or portion size of the food item [WILLETT, 1990].

2.2.4.1 Food List

The food list included in the food frequency questionnaire should be ideally adapted for the studied population. It is difficult to include all food items of interest while not providing too many foods so that the respondent will find the questionnaire easy to complete [BIRÒ et. al., 2002]. The food items in the questionnaire should meet three general characteristics:

- The food item should be eaten reasonably often by an appropriate number of individuals among the population of interest.
- The food item should have a substantial content of nutrient(s) of interest [WILLETT, 1990].

It is often necessary to place single food items into food groups to shorten the questionnaire. Related items should be clustered together; specific food items should always be placed before general items. The food list always depends on

the purpose of the study and can range from very few items up to a few hundred food items [CADE J et al., 2001].

2.2.4.2 Advantages and disadvantages

The FFQ method is a tool which can give insight into foods usually eaten. A comparison within individuals who have a high or low intake of foods or nutrients can be done. Because FFQs are usually self-administered or sometimes reviewed by an interviewer they require fairly little time to be completed. They are quite inexpensive compared to other dietary assessments because they are mostly pre-coded which facilitates simple data handling. The participant's usual eating habit is not affected. The burden upon the study participant seems pretty small. The FFQ is therefore suitable for large population surveys [BIRÒ et. al., 2002].

However the FFQ can also give imprecise recollections. The participant's current eating behavior can influence reporting of dietary intake in the past. The quantification of a FFQ can also give incorrect information. The participant may use poor estimations of portion sizes. Also the high aggregation level of food types within food groups can lead to misunderstanding. The FFQ is also not open ended which could lead to a lot of missing information [BIRÒ et. al., 2002].

2.2.5 Weighed food records (WFR)

The food weighed record is a tool to assess present food intake. It is suitable for the analysis of nutrient intake for a specific group of people, to measure the energy intake and to explore the connection between dietary intake and disease [ELMADFA and LEITZMANN, 2004]. Reporting of dietary intake must be completed on a sheet of paper giving the exact weighed or portion size of each food eaten. Cooking methods should be included. The weighed food record should be completed over consecutive days, depending on the study, usually somewhere between 3 to 10 days. All week days should be represented equally. The weighing and recording of foods should be done at the time of consumption [BIRÒ et. al., 2002].

2.2.5.1 Advantages and disadvantages

The dietary weighed record is a pretty accurate method to assess food intake. It is often referred to as the 'golden standard' among dietary assessment methods. Foods being missed or forgotten are very seldom as the weighed food record does not depend on the participant's memory. It is open ended and therefore can include a lot of information given by the study participant [BIRÒ et. al., 2002].

Although its handling looks very straight forward, dietary professionals are indispensable. The study participant has to be highly motivated and cooperative. Actual eating habits could be modified due to the high burden of the participant. Usually the reliability decreases over time as the participant becomes tired or board of recording all foods consumed [BIRÒ et. al., 2002]. Another disadvantage of the dietary weighed record is that the implements required for the procedure are expensive [ELMADFA and LEITZMANN, 2004].

2.2.6 Validity of food frequency questionnaires

Validation of the FFQ is essential. Otherwise, incorrect data about dietary factors and disease might lead to false associations and misinformation [CADE J et al., 2001].

Distinguishing between external and internal validity is essential for food frequency questionnaires. External validity determines whether the outcomes or findings of the FFQ give a reasonable representative of the true situation among a population whereas internal validity gives information about the FFQ and what it is supposed to measure in relation to that individual's eating habits. External validity cannot exist without internal validity [BIRÒ et. al., 2002]. When this chapter uses the term validity it always refers to internal validity.

Though it might not be possible to determine absolutely whether the FFQ actually measures the aspects of diet that it is developed and intended to measure, the comparison to a superior although also imperfect standard

generally provides a greater degree of certainty. The individual outcomes of the FFQ are compared with an independent measure of diet, a professed ‘golden standard’. Although no dietary assessment method is perfect and always correct it is crucial that errors of both comparing methods are independent and uncorrelated. Otherwise spuriously high estimates of validity could be found leading to misleading results [WILLETT, 1990].

As evidenced by the least correlated errors among dietary assessment methods, food frequency questionnaires and weighed food records are often used for validation studies. Major sources of errors among a FFQ are forgetting foods, the misperception of portion size, and the subjective interpretation of written questions. These errors are usually not shared with the weighed food record which gives specific information about portion size, and in which no records depend on the memory of the participant. On the other hand, the evaluation clearly relies upon the dietician’s approach to coding records rather than the participant’s undependable response to open questions [WILLETT, 1990].

2.3 Current Studies

The validity of food frequency questionnaires has been examined in many studies. Depending on the survey, different dietary assessment methods have been used to validate a food frequency questionnaire. However this paper focuses only on validation that uses a weighed food record, with other validation studies using different comparisons should briefly be included in this chapter. The main concern of this thesis was to develop a questionnaire to analyze total energy intake. The literature review should however give a quick insight of other main targets in evaluation studies.

2.3.1 Assessing validity of FFQs through WFR

FFQs have been developed for many reasons in dietary epidemiological studies. They do not always measure total energy intake and dietary behavior and are often used for other specific purposes. Sometimes a FFQ focuses on a single nutrient and sometimes they cover the whole spectrum of nutrients.

However depending on the aim of the study a FFQ should still be tested for its ability to credibly measure dietary behavior or nutrient intake as intended [BIRÒ et. al., 2002].

A few studies have used alternative approaches to evaluating the validity of their FFQs through a weighed food record. The population or participants, the timeframe of the weighed food record, the nutrients of interest and the outcomes vary from study to study. A short overview should illustrate studies done in this field and its influencing variables.

The validation study with subjects from South Dakota and Wyoming used a 1 day weighed food record to validate their self administered food frequency questionnaire. One hundred thirty-eight subjects (64 males and 74 females) were included in the survey during a 6-month to a one year period. The FFQ consisted of 116 food items and was intended to measure intake of 22 dietary nutrients. The correlation coefficient between dietary intakes from the FFQ and the one day weighed food record was 0.42. Higher correlations could be found after adjustments for energy, age and sex. No significant differences of the correlation could be found between men and women. Although the correlation coefficient was relatively small, the study conducted the authors support the use of the self-administered food frequency questionnaire in general populations [LONGNECKER et al., 1993].

The aim of the validation study among Greek adolescents was to assess overall dietary behavior and nutritional intake. 250 pupils were included in the study with a mean age of 15 years old. The semi-quantitative food frequency questionnaire was validated with a 3 day weighed food record. The Pearson's correlation coefficient was determined for almost all nutrients. It ranged from 0.83 for energy intake to 0.34 for folate intake. Also non significant correlations were found, for example for selenium and vitamin D intakes. Overall the authors suggest that the study provides evidence for the validity of the food frequency's

scale and utility to assess nutritional intake of Greek adolescents [PAPADOPOULOU et al., 2008].

Another study from 2009 obtained correlation coefficients between their FFQ and their weighed food record less than ideal. However they still thought the FFQ ranked a reasonable portion of adolescents correctly. This study included 785 14-year olds from Western Australia who completed a FFQ in comparison to a 3-day weighed food record. Their FFQ was designed to measure the overall dietary intake and included many different nutrients. A correlation coefficient between 0.11 for polyunsaturated fats to 0.53 for riboflavin was found. The conclusion of this article raised the question if a food frequency questionnaire seems to be appropriate for adolescents who might have a limited knowledge of foods and the ability to quantify portion sizes [AMBROSINI et al., 2009].

An even younger population was targeted in the validity study of Flemish preschoolers. 2.5 to 6.5 year old children were used to validate a semi-quantitative FFQ against a 3 day weighed food record. In this case the parents perform the task for their children's eating habit. The FFQ was repeated within 5 weeks for reproducibility purposes. A total of 650 children were included in the study. Correlation coefficients between the FFQ and the weighed food records ranged between more then 0.6 to less than 0.4 among different food groups. The results of the developed FFQ in the study, as stated, give reproducible estimates of food group intake among Flemish preschoolers. They claim that moderate levels of validity were observed [HUYBRECHTS et al., 2009].

In other parts of the world a multiethnic population was observed. A validation study among 55 Brazilian women, 26 Caucasian, 15 Japanese and 14 other mixed ethnicities was conducted. An already developed food frequency questionnaire for a case-control study on breast cancer was validated using two weighed food records in different seasons. The aim of the FFQ was to include energy intake as well as 24 different nutrients. The highest correlation

coefficient was found, after energy adjustment for isoflavones, to be 0.76. Some dietary intakes (chicken/poultry, eggs and legumes) were overestimated by the FFQ other intakes (pork and fat) were on the other hand underestimated. Overall the conclusion of this article was that the already existing FFQ gives moderately high validity for the intake of selected nutrients among Brazilian women [ISHIHARA et al., 2009].

Shifting the focus from many nutrients to very specific nutrients this validation study should give a short example. The FFQ developed in this study measured dietary fatty acid intakes and includes 129 different food items. It was compared with a 7-day weighed food record over a one year period. Thirty-one adults completed both, the FFQ and the weighed food record. The two dietary assessment methods correlation coefficients ranged from 0.29 for 18:1*n*-9 to 0.71 for 20:4*n*-6. The conclusion of the authors is that the FFQ provides reliable estimates of dietary intake of many fatty acids. It should therefore be an authentic method for use in epidemiological studies [BOARDFIELD et al., 2003].

Another recent validation study which used a weighed food protocol as a comparison for their FFQ focused on dietary amino acid. The study participants were made up of 565 adults, sub-sampled from two different populations. All subjects had to complete the questionnaire and to fill out a 28 day weighed food record as a reference method. The correlation coefficient calculated ranged from 0.15 to 0.52 for various amino acids. The authors declared validity of their FFQ in comparison to the weighed food record for amino acid intakes for low to moderate [ISHIHARA et al., 2009].

2.3.2 Assessing validity of FFQs through other dietary assessment methods

In other studies the food frequency questionnaire was validated with different dietary assessment methods than the weighed food record.

The study conducted among Alaskan people used a seasonal 24h - diet recall to validate their FFQ. Each of the 58 participants was to provide 4 24h - recalls, 1 per season. The FFQ included 26 nutrients. After energy adjustments they calculated Spearman correlation coefficient between 0.15 for protein and 0.49 for monounsaturated fatty acids. Fifteen of the 26 nutrients were observed to be correlated among the two dietary assessment methods. They concluded that the FFQ should be used to evaluate intakes of Alaska Natives in western Alaska only for correlated nutrients [JOHNSON et al., 2009].

Similar approaches to validate a FFQ through a 24h - recall are described in a study performed among pregnant women in rural China. The study included 124 women at 23 to 26 weeks of gestation. Two FFQs and six repeated 24h - recalls were used to calculate the Pearson correlation coefficient which ranged from 0.31 for thiamin to 0.61 for fat comparing both assessment methods [CHENG et al., 2008]. In Japan a validation study among 76 middle aged men and women also used 4 24h - recalls. The correlation coefficient between the FFQ and the 24-hour recalls ranged from 0.53 for carbohydrates to 0.046 for polyunsaturated fatty acids [NAGAKO et al., 2008]. Both studies suggested their developed FFQ would be an appropriate dietary assessment tool.

In other studies more than two dietary assessment methods were compared.

An early study compared food frequency questionnaires with weighed food records and estimated diet records. The study sample consisted of 150 male and female from the French Mediterranean region. All three different assessment methods, a 4 day weighed dietary record, a 7 day estimated diet record and a semi-quantitative food frequency questionnaire, were completed. The validation process included foods as well as nutrients. The FFQ was said to be a reliable measure of macronutrient intake and a good measure of micronutrient intake. However it performs less well for food intake [BONIFACJ et al., 1997].

An overall comparison of eight dietary assessment methods was conducted in a study in Cambridge. 160 women aged 50 to 65 were asked to complete four 4 day weighed food records, a simple 24h - recall, a structured 24h - recall, two food frequency questionnaires, a 7 day estimated food record, a structured food frequency menu and a structured food frequency menu with portion sizes. When comparing the different methods the food frequency questionnaires were not better at placing individuals in the distribution of habitual dietary pattern than 24h - recalls [BINGHAM et al., 1994].

2.3.3 Assessing validity of FFQs trough biochemical markers

Sometimes dietary assessment methods are validated not only through other dietary assessment methods but through biochemical markers. These biochemical markers are selected specifically for different nutrients.

The evaluation study in Northern Sweden validated an eighty-four food item FFQ to estimate fatty acid intake with a 24h - recall and the fatty acids in erythrocyte membranes as their biochemical marker. Ninety-six men and ninety-nine women were included. The fatty acids content in erythrocyte membranes should give an additional validation instrument with almost completely independent errors of both assessment methods. Correlation coefficient between the FFQ and the 24h - recall ranged between 0.29 and 0.60. Significant correlations between the FFQ and the biochemical marker were only seen for milk fatty acids and fish fatty acids. Therefore the FFQ did not satisfy the estimated intake of fatty acids derived from vegetable oils [WENNBERG et al., 2009].

An analogical study used erythrocyte membrane fatty acid composition in young children as a biochemical marker to validate their semi-quantitative food frequency questionnaire. The comparison between omega-3 and omega-6 polyunsaturated fatty acid intakes was assessed. In this study from Colorado the FFQ which was completed by the parents provided estimates of average

long-term intakes of marines PUFAs correlated well with the erythrocyte cell membrane fatty acid status [ORTON et al.; 2008].

The present study focuses only on the total dietary energy intake. A specific biochemical marker for energy intake is the doubly labeled water. It should be the golden standard technique for total energy expenditure assessment and can be used as an unbiased reference biomarker for energy intake [SCAGLIUSI et al., 2008].

A study conducted among Brazilian women used the doubly labeled water method to compare validity of self-reported energy intake obtained from three dietary assessment methods. Three 24h - recalls, a 3 day food record and a food frequency questionnaire were completed by the sixty-five study participants. The FFQ used in the study however differed greater in under- and overestimation of energy intake than the other dietary assessment methods when validated with the doubly labeled water [SCAGLIUSI et al., 2008].

Another FFQ was tested for validity by the doubly labeled water as the reference biochemical marker. Similar conclusions were drawn from the study among 20 women. None of the dietary assessment methods, which included a FFQ, a 7 days weighed food record and a 24h - recall, gave accurate estimates of the usual energy requirement of individual subject [SAWAYA et al., 1996].

2.3.4 Validation studies conclusion

Of course, this quick overview only gives an impression of the diversity of validation studies, though it should allow insight into the quiet nascent research areas emerging from modern nutritional epidemiology in relation to FFQs. Research opportunities are endless as every study using a FFQ, in every country, for every target population, and every specific nutrient of interest needs their own contextually specific questionnaire. Dietary patterns are different from country to country and always need to be adjusted when using a FFQ in a specific area. The participants from different studies always vary depending on

targeted populations. Different FFQs need to be developed for children and adults. Sometimes contaminants like dioxin are the main concern [BILAU et al., 2008]., sometimes a nutrient like zinc [SAMMAN et al.; 2009]. should be evaluated and sometimes a variety of many nutrients should be captured by a FFQ.

The validation methodology depends on the aim of the study and the researcher's interests. Though it is impossible to summarize all the different studies done in the field of nutritional epidemiology, due to its many alternatives and varieties, there is still a lot of room for newly conceived modes of study and research pathways.

An FFQ developed for the Austrian population capturing total energy intake of individuals and validated with a 3 day weighed food record using new data to generate the food list has yet not been conducted. Though similar studies might exist, the many varieties of validation study ensure that they will never overlap entirely.

Total dietary energy intake is a crucial concern in the Western civilization. Hence new approaches for developing good methods of looking at this specific health indicator are of the utmost significance.

3 Methods

3.1 Study population

A convenient sample from family, friends and colleges completed a semi-quantitative FFQ and a 3 day weighed food record between March 2009 and September 2009. Both dietary assessment methods were completed within the timeframe of less then 6 months apart. Although at the beginning more subjects gave their consents to participate in the study, a lot dropped out during the first information steps. The efforts seemed too big and the burden on the participants too high. Finally the study included 36 adults aged 21 to 51.years.

3.2 Development of a semi-quantitative food frequency questionnaire

The food frequency questionnaire developed in this study should capture at least 90% of all energy intake based on an Austrian diet. It was to be self administered and should include all foods and food groups that contribute significantly to a persons dietary energy intake. To aggregate such a comprehensive amount of foods a very specific approach, called the “key foods”, was taken. Aggregated foods were then summarized into food groups using mean calculations. To every food item or food grouping a frequency and portion size question was developed. The overall calculation then enabled an estimation of the total dietary energy intake per day (kcal/d).

Figure 3 should roughly outline the procedure for the development of the semi-quantitative food frequency questionnaire to assess dietary energy intake. Specific explanations will follow in this chapter for each development step.

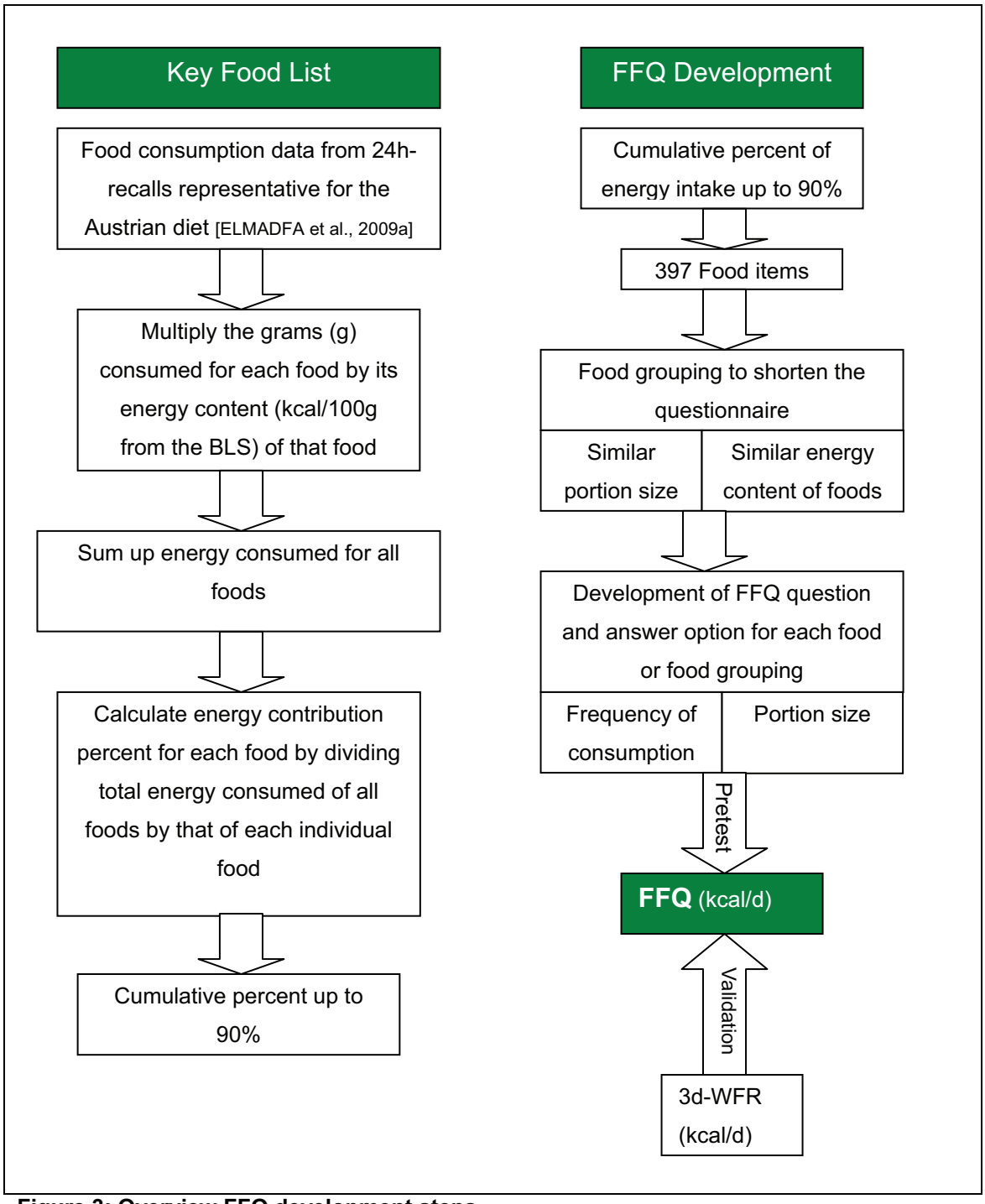


Figure 3: Overview FFQ development steps.

3.2.1 Key foods for composition research

The United States Department of Agriculture's National Food and Nutrient Analysis Program used the same procedure to identify specific foods which provided significant amounts of nutrients important for public health. They wanted to update their existing USDA Nutrient Database by analyzing new

foods on the market as well as to correct their already existing ones. Due to the variety of different foods available they had to choose out of 6040 different foods the most significant foods with their components regarding public health issues. Finally they came up with a manageable number of 666 different foods. This reduction approach to capture the most important foods was called the key foods list and functions as an appendix for this paper [HAYTOWITZ et al., 2002].

Our study focuses its lens on the total amount of dietary energy intake, rather than the many different nutrients influencing public health. To identify the key foods for energy intake in the Austrian population, existing data collected in the course of the dissertation project carried out by Schätzer [2007]. at the University of Vienna, Institute of Nutritional Sciences, were used. The data set also built the basis for energy and nutrient intake and food consumption among Austrian adults as described in the Austrian Nutrition Report 2008 [ELMADFA et al., 2009a].

The study population was representative for the Austrian population, including 2479 subjects. Each study participant completed a 24h - recall in addition to a food frequency questionnaire. The data set from those 24h - recalls was used to aggregate the Key foods [ELMADFA et al., 2009a].

The quantity of a food eaten by the Austrian population was multiplied by its energy density (kcal/100g) to know how much energy this specific food contributed to the total energy intake of the population. Every single food identified through the 2479 24h - recalls [ELMADFA et al., 2009a]. was included in the calculations. If a food consisted of more than one single item like in recipes the energy density from the BLS for that recipe was used for further calculations.

Finally all consumed energy (in kcal) from all foods for all study participation was added together, which gave the total energy intake of the whole population

in a day. For every food then its percentage that contributed to the energy intake was calculated by dividing the total amount of energy consumed for all foods by that for each individual food. Ranking those percentages of individual foods in an ascending order we could see what contributed most to the dietary energy intake of the Austrian population.

This list included 1724 different food items and recipes. However only 397 foods where then used in the semi-quantitative food frequency questionnaire. This number was chosen because the cumulative percentage of up to 90% of the population's energy intake comprises these 397 different foods.

Figure 4: shows the top 10 food items which contribute most to the Austrian dietary energy intake) displays that only 10 food items cover more than 25% of all dietary energy intakes within the Austrian population, assuming that the dissertation conducted previously covered and explored Austrian's diet accurately [ELMADFA et al., 2009a].

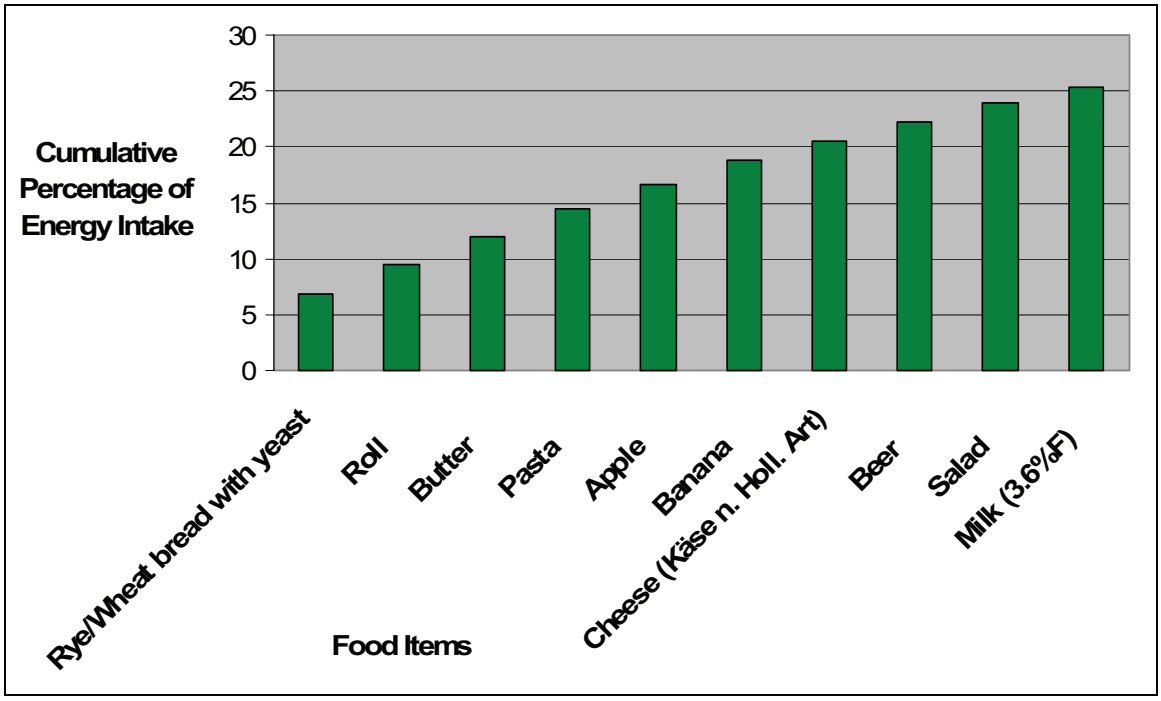


Figure 4: shows the top 10 food items which contribute most to the Austrian dietary energy intake [ELMADFA et al., 2009a].

Most of the energy intake within the population comes from bread made out of rye or wheat. If adding rolls to that number the Austrian population would cover almost 10% of their energy intake from bread. The average meal consumed and contributing to the energy intake seems to be pasta. But not only carbohydrates make up a lot of the energy intake among the Austrian population, fat in butter and cheese also contributes to the potential energy intake.

It might seem surprising to see fruits like apples and bananas to rank upon the top 10 Key Foods. Not only the energy content of a food but also its consumption rate, as described in the calculations above, played a part at generating the key foods. It can therefore be assumed that apples were consumed far more often than any other vegetables. Bananas already have a higher energy density and therefore did not need to be eaten as often as apples in order to rank among the top 10 food items contributing to the overall energy intake.

Within the Key Foods also recipes were included which explains number 9 upon the top 10 food items. Salad was treated as a combination that included dressings like oil and vinegar. Therefore salad contributed to more than 1.5% of all potential energy intakes among the Austrian diet.

Surprisingly beer was but on number 8 of total dietary energy intake contribution, because also beverages were included in the key foods. One might wonder if beer has such a high energy density. With a potential energy of 42kcal/ 100g, beer is suggested to be consumed far more often by the Austrian population than other drinks. As a comparison apple fruit juice has a potential energy of 49kcal/100g [HARTMANN et al., 2005].

Although 397 food items were included in the Key Foods the exact percentage of its contribution to the total dietary energy intake of the Austrian population cannot be determined. Even though at least 90% of the total energy intake was included, the number was probably even higher. This can be explained by a

simple example: Fruit yoghurt made out of blueberry did not reach the cumulative 90% mark. It was placed on number 485 of food items that contributed to the overall dietary energy intake of the Austrian population. This means that fruit yoghurt made out of blueberry did not have such a big affect on the total energy intake of the Austrian population as other food items did. However blueberry fruit yoghurt was included in the developed food frequency questionnaire. This happens to be because fruit yoghurt made out of strawberry and peach both ranked within those 397 food items on the key food List. Because the potential energy differences of fruit yoghurts were significantly low they all were grouped into a single question and formed into one food group of fruit yoghurts without differentiating to its special kind. Therefore all fruit yoghurts were included in the study and not only those who were upon the 397 food items.

This example should illustrate that many more food items were actually included in the study and the figure of 90 % of all food items that contribute to the total dietary energy intake might be elevated to a much higher number. Therefore the statement that at least 90% of all dietary energy intakes within an Austrian diet were covered in this study reveals itself to be actual fact.

3.2.2 BLS

The Bundeslebensmittelschlüssel (BLS) is an electronic food composition table. It was developed in Germany and can be used as a standardized instrument for the evaluation of nutritional epidemiological studies and food consumption surveys. With help from the BLS it is possible to capture changes of dietary behavior within the population [HARTMANN et al., 2005].

The aim of the BLS is to provide a basis for scientific research in all areas of food consumption surveys. The elimination of variations due to different nutrient content tables, portion sizes and reference weights should enable a standardized and comparable foundation for all food consumption surveys [HARTMANN et al., 2005]. For the realization of its goal the BLS was developed out of 3 sections:

- A coding system to classify, well-define and quickly identify foods and to determine its processing, preparation and reference weights.
- A databank with analyzed and calculated ingredients of foods.
- A collection of dishes from households, gastronomy and communal feeding with its standardized portion sizes [HARTMANN et al., 2005].

The BLS consists of average nutritional values of the most important foods available on Germany's market [HARTMANN et al., 2005]. 2006 the BLS consisted of approximately 10 000 foods each of which broken down into 133 components. This list will be updated when new foods are put on the market or analysed by the Max-Rubner-Institut (fomer Federal Research Centre for Nutrition and Food (BfEL)) [HARTMANN et al., 2006].

The constant renewal of the BLS has put out a revised version Ⅱ.4 in 2008. In this paper however Version Ⅱ.3.1 was used for food composition analysis [HARTMANN et al., 2006]. The aim to publish a compatible databank of European nutrient data networks leads to the development of an optimized completely new nutrient database containing revised food classifications and descriptions. The publication of version Ⅲ is expected in 2010 [HARTMANN et al., 2008].

Austria does not have its own electronic food composition table and it is therefore obliged to use already existing databanks. The BLS therefore incorporated specific Austrian products and recipes to be used in Austrian nutritional surveys [HARTMANN et al., 2008].

In the present study the nutrient content from different foods only from the BLS was taken. The main goal was to evaluate the food's potential energy. The energy density values of foods consumed among the Austrian population were used to calculate the Key Foods as described. The energy content of food items was described as kcal/100g for a specific food listed in the BLS [HARTMANN et

al., 2008]. It was therefore possible to calculate the dietary energy intake among the Austrian population.

3.2.3 Grouping of food items

After generating the Key Foods the main target was to incorporate all 397 foods into one semi-quantitative FFQ. It is obvious that no study participant would fill out a questionnaire with two sets of 397 questions. As described in the introduction part of this paper a food frequency questionnaire always asks how often a food is consumed and eaten [CADE et al., 2001]. But in this semi-quantitative food frequency questionnaire also the portion size was demanded for specific calculations. Therefore to every single food item on the Key Food list two separate questions would have emerged. Given those preconditions we needed to cut down the questions quite drastically.

Food items were put into food groups to shorten the questionnaire. This alone was a challenge because of the great differences of potential energy among food items. As a compromise, foods with similar potential energy and portion sizes were put into food groups. As explained in the example of the blueberry fruit yoghurt it could no longer be differentiated into many kinds of fruit yoghurts. The grouping in this example was finally done only for full fat yoghurts compared to low fat yoghurts. In both categories fruit yoghurts were included in the calculations, however only differentiated by their fat level and therefore their potential energy or kcal content.

The energy density of a food group was not only calculated by the average of the food items within one group. The amount to which they contribute to the overall energy intake of the population was included in the specific calculations. For example each kind of yoghurt was consumed more or less often by the Austrian population. If strawberry yoghurt was consumed more than natural yoghurt, the potential energy of the strawberry yoghurt was represented more than the natural yoghurt in the average energy density of the overall food group. This calculation enabled a better energy density value for the food group in

order to be representative for each food item included in the questionnaire. Specific mean calculations for each food grouping can be seen in the annex of this paper.

After calculating the mean potential energy intake of the different food groups and their average portion sizes they were put on paper and asked in the questionnaire.

To alleviate the completion of the FFQ for the study participants the questionnaire was divided into 7 different categories:

- Sozio-demographic data
- Fruits and vegetables
- Cereal products
- Milk, fat and eggs
- Meat and fish
- Sweets
- Drinks

This enumeration should ease the completion of the questionnaire for the study participants because it was built up a little like a menu.

3.2.4 Calculation of energy intakes

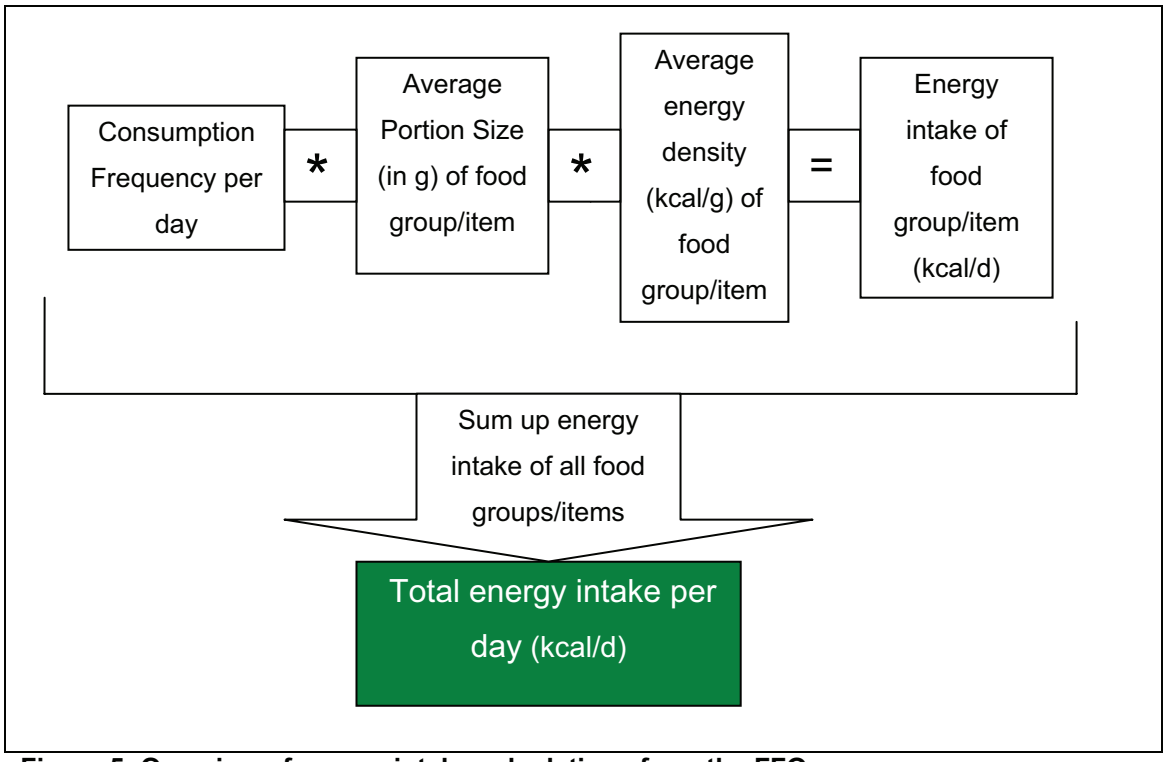


Figure 5: Overview of energy intake calculations from the FFQ

Figure 5 should quickly illustrate the calculations after the study participants had filled out the FFQ. The specific average calculations are attached in the annex of this paper. The aim of the calculations was to capture the daily energy intake (kcal/d) and shall be explained in further detail.

3.2.4.1 Frequency

After the decision on the food grouping and the layout of the questionnaire the different answer options were developed. For every frequency question, how often a food item or food grouping was consumed and eaten, 9 answer opportunities in an ascending order were given to choose from.

Participants were told to check the option with the box ‘never’ whenever they ate a food less than once a month, because then the potential energy of that food item wouldn’t accumulate to his/her daily dietary energy intake in a significant calculable figure.

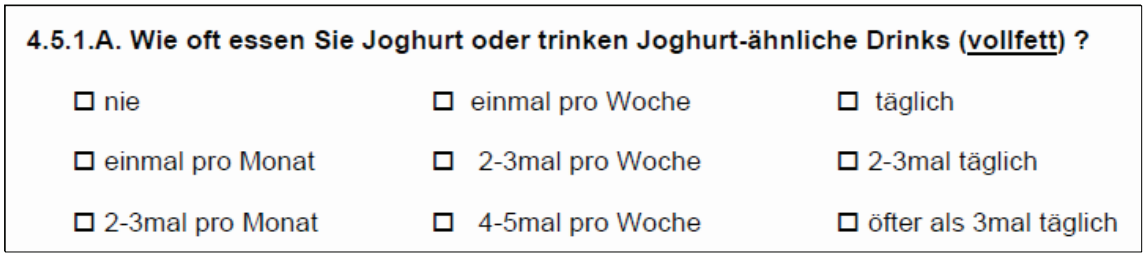


Figure 6: illustrates an example of a frequency question from the FFQ.

For further calculations all frequencies were transformed into values per day. When a frequency category was five as a range (e.g. 4-5 times a week), than the mean was assumed (4,5 times a week). For frequencies given as "more than" (e.g. more than 3 times a day) the nearest next value was assumed (4 times for the mentioned example). The frequency values per day for the specific calculations are demonstrated in table 4.

Table 4: Frequency values per day

Frequency answering option	Values per day
☐ nie	0
☐ einmal pro Monat	0,03
☐ 2-3mal pro Monat	0,08
☐ einmal pro Woche	0,14
☐ 2-3mal pro Woche	0,36
☐ 4-5mal pro Woche	0,64
☐ täglich	1
☐ 2-3mal täglich	2,5
☐ mehr als 3 mal täglich	4

3.2.4.2 Portion Size

As there were always two questions to each food item the portion sizes needed to be defined. Most portion sizes were determined through already published literature [UNION DEUTSCHE LEBENSMITTELWERKE, 1997]. If no data for a specific food item was to be found the food was weighed or values from the food labels were used. Sometimes the portion sizes from the BLS were used [HARTMANN et al., 2008].

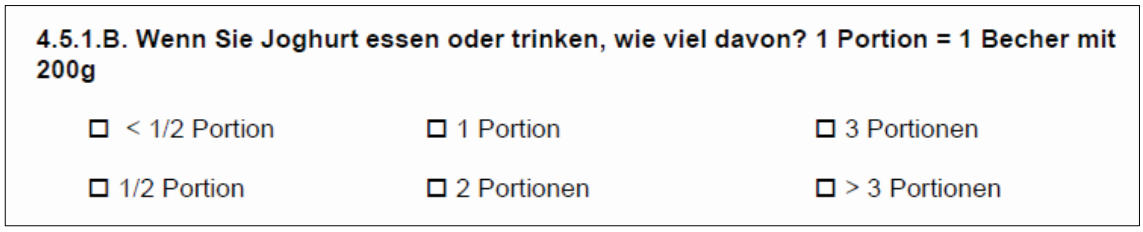


Figure 7: An example of a quantity question from the FFQ.

Depending on the food item different numbers of answer options were given to choose from. For the example shown in Figure 7, 6 portion sizes were given to choose from. If a study participant checked box never on the frequency question he/she was asked to leave the quantity question blank.

For each option of the portion size the values in grams were calculated. In this example less than ½ portion amounted to 50 g, ½ a portion to 100g, 1 portion to 200g, 2 portions to 200g, 3 portions to 300g and more than 3 portions to 400g. For every single portion size question first the portion size in grams and then the answering options were developed and calculated.

If a portion size question included more than one food item the portion size was either asked separately or a mean of each portion size of the included food item was calculated.

3.2.4.3 Energy density

The portion size of a specific food item gave information about the quantity of a specific food eaten in grams. As our main concern was to assess dietary energy intake we needed to convert the grams into kcal. For this calculation we needed to know the energy density of each food item or food group in kcal/100g. All energy contents of specific food items were taken from the BLS [HARTMANN et al., 2005].

First the energy density from the BLS was divided by 100 to give the potential energy of one gram (kcal/g). Energy content from a specific food item or a food group in kcal/g was then multiplied by the portion size in g. This left the energy

content of the food item or food group in kcal. Food items with similar potential energy and similar portion sizes were grouped together. The average energy content and the average portion size were then used to calculate the potential energy for that portion size.

The potential energy of a specific portion size was finally multiplied with the frequency of use to determine the average daily energy intake from a specific food item. This enabled an accumulation of all foods eaten per day which led to the figure of the total dietary energy intake on an average day. The specific calculation can be found in the content part of this paper.

Although the questionnaire mainly contained closed question, which means answering was only possible by choosing from given answers, a few open questions need to be included. Those questions included a free option to answer.

The final version of the semi-quantitative food frequency questionnaire to assess dietary energy intake which was given to the study participants eventually took 30 to 45 minutes to be completed, was 25 pages long and included approximately 81 different food groups or food items when asked specifically. The FFQ was designed to be self administered and therefore a section with information and instruction on how to fill it out accurately was included.

3.2.5 Pretest

The semi-quantitative food frequency questionnaire was used in a pre-test to explore and to eliminate mistakes and ambiguity. To answer the questions accurately without misunderstanding might have seemed challenging because of the high density of different foods grouped. It was also important to stop the time frame of the food frequency questionnaire’s completion to know the burden put on study participants.

Some spelling mistakes were detected and key weaknesses were eliminated. Some questions were then redefined, some were asked in a simpler way. However a few unclear questions were kept as they were if no better option for improvement was found.

The pre-test was conducted among two volunteers. They were asked separately to complete the food frequency pre-test. While completing the questionnaire they were inquired to point out unclear passages and questions. After the completion of the pre-test a general impression of the questionnaire was discussed with both friends. A general revision of the food frequency questionnaire was then developed and used in the study.

3.3 3 day weighed food records

The participants got detailed instructions about weighing and recording all foods consumed. Additional information about how to complete the weighed food record was added in written form at the beginning of each weighed food protocol.

Scales were provided by the Institute of Nutritional Science of the University of Vienna. The scales were special digital cooking scales accurate to one gram. All cooking scales were calibrated and checked before handing them to the subjects. The participants were instructed to protocol all food items and drinks consumed, to weigh them, and to record the type and the time of the specific meal. The main target was the energy intake and therefore the participants were asked to give any additional information on food brands, cooking method or fat level if possible.

All week days should be represented equally. The weighed food record was to be completed over three consecutive days. The subjects were asked to start recording their food intakes on specific week days, to distribute them over a week period. Some subjects however did as it was most fitting to their time schedule. If food was consumed outside the home the participants were asked

to take their scales with them. If this seemed impossible they were enquired to estimate portion sizes of food items and describe them as detailed as possible.

After the first day of completing the food record most participants were called by phone and asked if they had additional questions. The encouraged motivation of the participants seemed important for the correct completion of the weighed food record.

Any incomplete information was verified with the study participant. Finally the weighed food records were correctly completed by 33 of the study participants. Energy and nutrient intake then was calculated using a nutritional-software [nut.s, 2009]..

3.3.1 Personal Characteristics and additional questions

A short questionnaire about age, sex, weight and height was attached to the weighed food record. This provided additional information about the subjects and enabled a better characterization of the study sample. Additional Questions included:

3.3.1.1 Education

The highest completed education was assessed for all subjects. They could choose from given answers including:

- Compulsory or primary school
- Secondary education
- Tertiary education

The categories were taken from STATISTIK Austria when comparing the International Standard Classification of Education (ISCED) within Austria [BÖNISCH et al., 2009]. These categories were however specified with examples to ease the completion of the questionnaire for the study participants. The variety of different Austrian education possibilities were therefore asked in further detail in our study.

3.3.1.2 Income

The subjects could choose from given answers to determine their salary. Income categories were selected at random, asked in Euro after deductions. The participants could choose from 5 answering options:

- 0 - 499 Euro
- 500 – 999 Euro
- 1000 – 1499 Euro
- 1500 – 1999 Euro
- Above 2000 Euro

Considering that most study participants were students the lower range seemed more important than the upper end.

3.3.1.3 Habitation

The study participants could choose from different habitation options:

- I live alone
- I live with my partner
- I live with my parents
- I live in a flat sharing community
- other: _____

3.3.2 Nut.s

The nutritional software Nut.s was used to analyse the weighed food records.

The data set used by the nutritional software nut.s comes from different sources. They are validated and always open for actualization. Nutrients and portions sizes derived from the Bundeslebensmittelschlüssel (BLS). Nut.s includes Austrian synonyms for German words. Nut.s utilized the version of BLS II. 3.1., which consists of 137 nutrients per food and 10000 different foods. Nutrient losses and preservation factors are used after Bognár. The DACH reference values were used for the nutrient intake and for upper levels. The

basal metabolic rate was defined after Schofield or Harris-Benedict; the energy intake reference values after Maughan [Nut.s, 2009].

This software enabled analysis of the individual's mean energy intake per day (kcal/d) when examining the 3 day weighed food records.

3.4 Statistical methods

Statistical analysis was performed using SPSS 15.0. Mean, standard deviation, median, and minimum and maximum values were calculated for both dietary assessment methods.

3.4.1 Normal distribution

The study outcome needed to be tested for normal distribution before analyzing in further detail. The mean energy intake distribution from both dietary assessment methods were compared to a normal distribution using the Kolomogorov-Smirnov test.

The total dietary energy intake from the FFQ, $D(26) = 0.19$, $p < 0.05$ was significantly non-normal. The total dietary energy intake however from the WFP, $D(26) = 0.15$, $p > 0.05$ was significantly normal. A further investigation using histograms and Q-Q plots gave more information about the distribution of our data.

The mean energy intake of the study participants completing the FFQ produce very positively skewed data. The majority of the study participants had an energy intake below 3000 kcal per day. Very few study participants cause a greater distribution towards the upper end. This visual analysis suggests that the study participants either have a very normal or lower energy intake. If this energy intake is elevated in some subject it produces a bigger gap to the 'normal' dietary behavior. These few subjects were found to have an abnormally high energy intake. There are relatively few who fall in this gap of extremes.

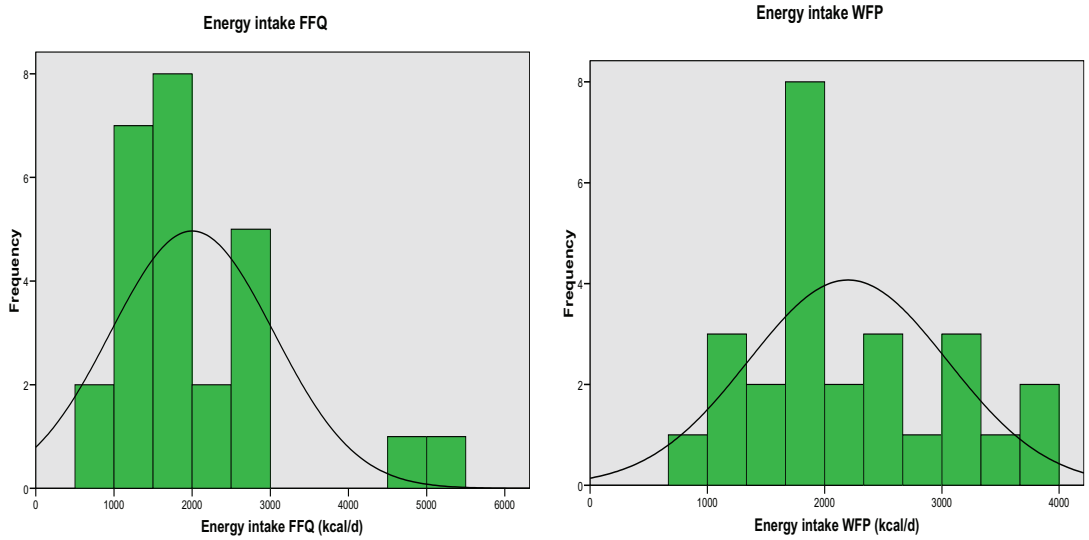


Figure 8: Histograms of mean energy intake (left: Food Frequency Questionnaire (FFQ), right: Weighed Food Record (WFR))

The mean energy intake from the WFP on the other hand presents a fairly even distribution on both ends. There are a few people with a low energy intake, more with a medium energy intake and on the upper end a few study participants with a higher energy intake. There is no gap between dietary energy intakes among the study participants like it is show in data collected from the FFQ.

A better comparison to a normal distribution can be observed from the normal Q-Q plot. The line in the normal Q-Q plot represents the expected values if the distribution were to be normal. The points on the other hand represent the observed or actually seen energy intake values from the data set. If the points would be overlapping with the line our data would be normally distributed. The longer distance between the points and the line marks a greater difference to normal distribution.

The normal Q-Q plot shows the later discussed outliers from the FFQ. The data set seems fairly normal distributed if those two outliers would be eliminated. The question of their elimination shall be discussed later. The WFP on the other hand does not show any great outliers. The data set is pretty much distributed

around the expected normal distribution. Still the dots do not cross the line in every point.

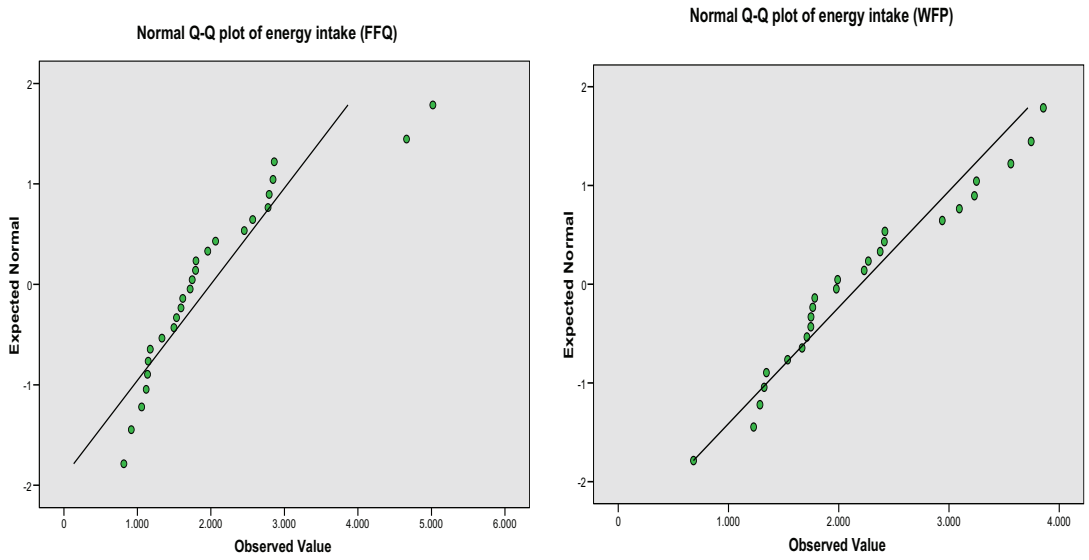


Figure 9: Normal Q-Q plot of mean energy intake (left: Food Frequency Questionnaire (FFQ), right: Weighed Food Record (WFR))

Statistical and visual evidence combined lead to the conclusion that our studied data of energy intakes per day (kcal/d) was not normally distributed from the FFQ and normally distributed from the WFP. Non-parametrical test were needed to further investigate the results.

3.4.2 Correlation Coefficient and Limitations

The Correlation Coefficient is still the common approach in validation studies. As described in the literature overview, a lot of very recent studies still use the correlation coefficient as their main statistical instrument to describe a relationship between two measurements.

A systematic literature review from 2006 found in 41 of 46 reviewed publications, based on physical activity questionnaires, the correlation coefficient as the current method in validation studies. Only 21.7% used a different approach to describe a relationship between two measurements [SCHMIDT and STEINDORF, 2006].

Spearman's correlation coefficient can be used when the data set has violated parametric assumptions, when the data set is non-normally distributed [FIELD, 2009]. Because one of our data sets (energy intake observed from the FFQ) is non-normally distributed the use of non-parametric tests is essential.

Validity was assessed by comparing the ranking of individuals by energy intake. Spearman correlation coefficient was used to investigate the association in the ranking of energy intake among the FFQ and the weighed food record. For the interpretation of the strength of the correlation and the direction of the relationship the categorisation after Bühl [Bühl, 2006]. was used (table 5).

Table 5: Interpretation of the Correlation coefficient [BÜHL, 2006].

Value of the correlation coefficient	Interpretation
0 < r <= 0.2	very low correlation
0.2 < r <= 0.5	low correlation
0.5 < r <= 0.7	moderate correlation
0.7 < r <= 0.9	high correlation
0.9 < r <= 1	very high correlation

Although the correlation coefficient seems to be a good way to test the coherence of two measures it still has its limitations. Bland and Altman criticize the use of the correlation coefficient for several reasons:

- The correlation depends on the range and distribution of the variables. The sample of subjects can therefore greatly influence the correlation coefficient. If the sample has a wide range of measurements, the correlation coefficient would be much higher than if the sample would have a restricted range. In this case the correlation coefficient should only be used if the selected sample represents the population we wish to study [BLAND and ALTMAN, 2003].

- The correlation coefficient is not affected by the scale of measurements, but it certainly affects the agreement between two methods [BLAND and ALTMAN, 1986].
- The correlation coefficient disregards any systematic bias between two variables. The correlation coefficient only looks at the degree of association, the validity of two methods. It disregards their agreement, whether the two methods can be used interchangeable. To illustrate this problem with an example we use two measurements Y and X. Their correlation coefficient would be r = 0.86. We use a third measurement Z, which would be obtained from adding 2.0 to X, an overestimation by 2 units for the true value. The correlation coefficient between Y and Z would be the same as Y and X, r = 0.86. The correlation between Y and Z may be the same as Y and X, however the agreement may not [BLAND and ALTMAN, 2003].
- The correlation coefficient tests for significance of the relation of two methods. It would be amazing if two methods measuring the same quantity were not related. The question of agreement is not dependent on the test of significance, it sees it irrelevant [BLAND and ALTMAN, 1986].
- High correlations can also demonstrate poor agreement between the two methods [BLAND and ALTMAN, 1986].

From other sources the practice has been criticized by the theoretically oriented literature for more than 20 years. The calculation of the correlation coefficient was said to be an insufficient potentially misleading approach for the validation of questionnaires [SCHMIDT and STEINDORF, 2006].

3.4.3 Alternative approach

Bland and Altman disagree with the use of the correlation coefficient when studying the agreement between different methods of measurement. They proposed a different approach called the 95% limits of agreement. The 95% limit of agreement was used to plot differences between energy intakes (kcal)

measured by the FFQ and energy intakes measured by the WFP against the mean measurement (energy intake from the FFQ and the WFP).

However this method depends on some assumptions about the data. The mean and standard deviation of the differences are constant throughout the data, and that these differences are from an approximately normal distribution [BLAND and ALTMAN, 2003].

The Bland and Altman plot is a way to check agreement between measurement and its reference measure graphically. The plotting of the difference between two measurements for each study participant against the average between the measurements shows a less compressed scatter blot which enables a more accurate inspection for systematic errors [SCHMIDT and STEINDORF, 2006]. The 95% limits of agreement are for a visual judgement of how well two methods of measures agree. The smaller the ranges of both methods are the better the agreement is [Editorial, 2007].

The major advantage of the Bland and Altman plot is that systematic and random errors are described separately. The systematic error is estimated by the mean of the differences for each study participant and the random error is estimated by the standard deviation of the differences [SCHMIDT and STEINDORF, 2006].

3.4.4 Mann-Whitney test

The association between personal characteristics of participants and the difference in energy intake among both dietary assessment methods was assessed using Mann-Whitney test.

4 Results and Discussion

4.1 General description of the study participants

4.1.1 Sample size and exclusion criteria

An overall number of 36 study participants were included in the FFQ validation study. This number was reduced to only 26 study participants because of several reasons:

Some study participants did not complete the whole FFQ. They left out answers or returned a blank overall questionnaire.

Some study participants completed the dietary food protocol inaccurately. If no consultation with the study participant was successful he/she was excluded from the study.

Two study participants were excluded from the study because their results from the FFQ seemed impossible and led to the conclusion that they did not fill out the FFQ correctly. The kcal intake calculated from the FFQ ranged between 8000 and 9500 kcal per day. These figures did not seem plausible for the inclusion within our study. Overestimation might have had several reasons. It might be possible that participant's compliance was too low, but it might also be possible that filling out a FFQ was a too complex task as not only the frequency but also the amount had to be estimated.

One study participant was on a diet while completing the weighed food record. When filling out the FFQ the subject however described his usual dietary behavior. The high discrepancy between the dietary assessment methods led to the participant's exclusion of the study.

Another study participant marked the frequency response question of certain food items when filling out the FFQ with 'never'. It was suggested that this

subject never ate those specific food items. When the subject however completed the weighed food record he included some of these food items who he previously excluded from his usual diet. Due to the inconclusive answer the study participant was excluded.

This left a number of 26 study participants who accurately completed the FFQ and the weighed food record within the timeframe of 6 months apart. All results described later are related to these 26 study participants.

4.1.2 Age

Only adults were included in the validation study. The average age was 28.5 ± 8.7 (mean ± SD). The youngest study participant was 21-years old; the oldest was 51-years old. The participants were not represented for each age group evenly.

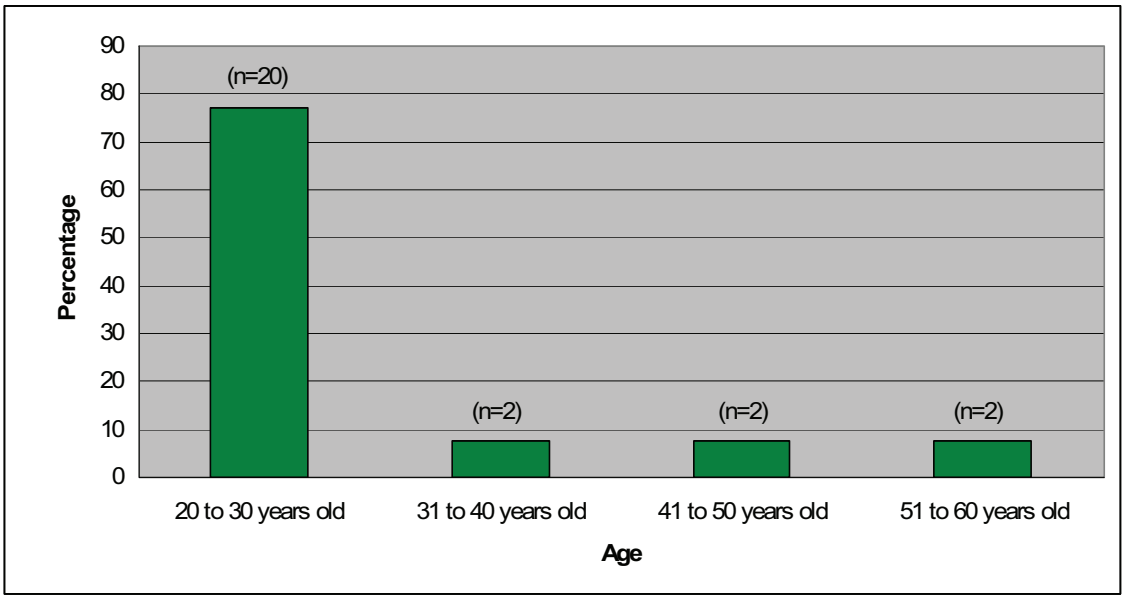


Figure 10: Age distribution among study participants

Figure 10: Age distribution among study participants) shows the overly represented age group of 20 to 30 years of age. Still it was important to combine a homogenous group of adults with explicit exclusion of children, adolescents and elderly persons. This should enable a better comparison of the

study participants and furthermore highlights the development of a FFQ for adults alone.

4.1.3 Sex

More women completed both dietary assessment methods and were included in the validation study. Out of the 26 participants, 15 (57.7%) women and 11 (42.3%) men completed the food frequency questionnaire and the 3 day weighed food protocol.

When comparing this figure to the Austrian population also more women are represented in the country. There were 51 % women and 49 % men living in Austria by 2006 [STATISTIK AUSTRIA, 2007]. The gap between both genders represented in our study is a little bigger when compared to the Austrian population. Therefore women were overly presented among the study participants.

4.1.4 BMI

The height and weight of the study participants were reported by the participants in the first section of the weighed food record. The additional information enabled an estimation of the BMI. The BMI was calculated by dividing the weight (kg) through the square of the height (m) for each study participant.

Participants were classified into BMI categories according to the WHO [WHO, 2009a].. These BMI categories are used for adults over the age of 20. A BMI below 18.5 represents an underweight nutritional status, between 18.5 and 24.9 is described as normal, a BMI between 25.0 and 29.9 as pre-obese, a BMI between 30.0 and 39.9 as obese and a BMI above 40 as very obese. These categories from the WHO were adopted to describe the nutritional status of our study participants [WHO, 2009a].

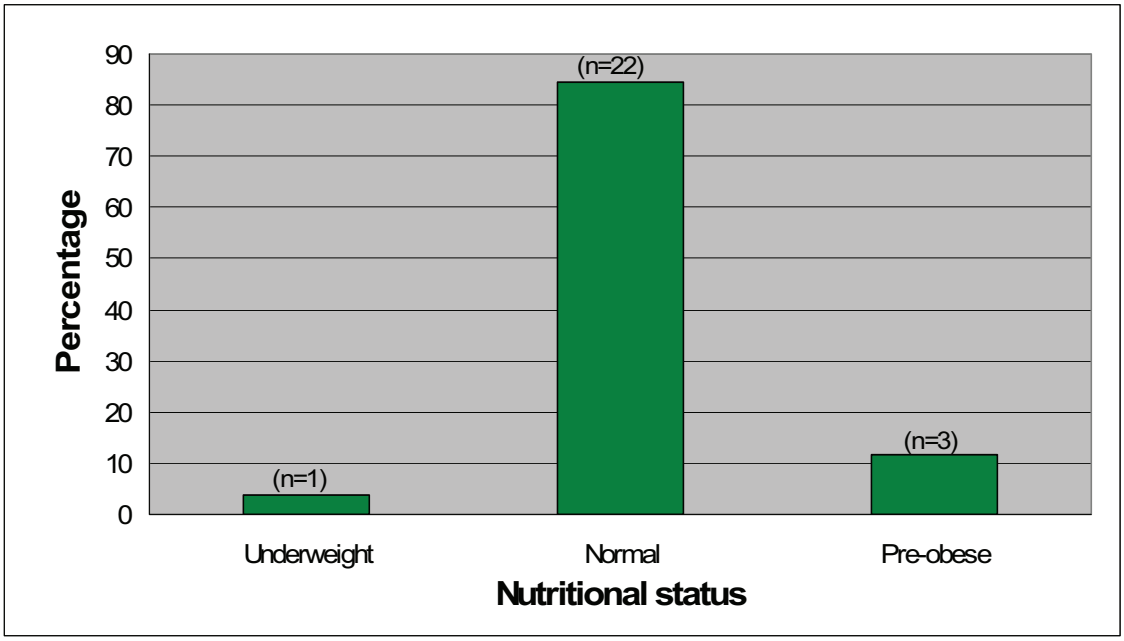


Figure 11: Nutritional status of study participants categorized by the BMI

Almost all study participants were classified to be normal weight. None of the participants was classified as obese or very obese. Figure 11: Nutritional status of study participants categorized by the BMI) shows that only 4% of the study participants were underweight and 12% were assessed to be pre-obese. The nutritional status according to the BMI seemed to be satisfyingly ideal among most study participants.

4.1.5 Education

All study participants were skilled with at least a secondary education. 30 % even had a tertiary education. A tertiary education includes the completion of a university, college or polytechnic or an academy.

Compared to the Austrian population's education in 2007/08 the study participants are overly represented with a high educational level. Among the Austrian population 18.5 % are equipped with only a primary education [BÖNISCH et al., 2009]. This group is not at all represented in our validation study.

4.1.6 Income

All income categories were represented as described in Figure 12: Income categories of study participants).

As expected 48% of the study participants had an income below 1000 Euro. However all income categories were represented in our study shown in Figure 12: Income categories of study participants.

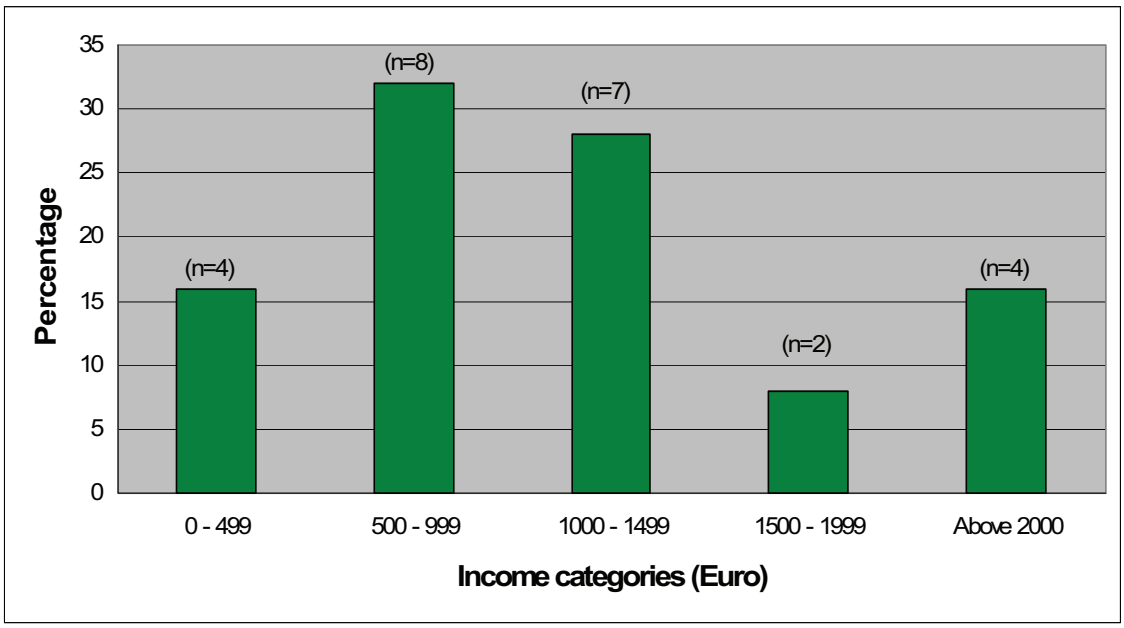


Figure 12: Income categories of study participants

One study participant chose not to answer the income question. The subject was therefore not included in the calculations.

4.1.7 Habitation

Habitation was asked as another socio-demographic characteristic of the study population. The study participants were a quite heterogeneous group when asking about their habitation.

Due to the high percentage of young adults included in this study the living situation of these individuals seemed to be corresponding. 42% of the subjects were sharing their flat with other flat mates. This habitation is explained when knowing that many study participants were still students.

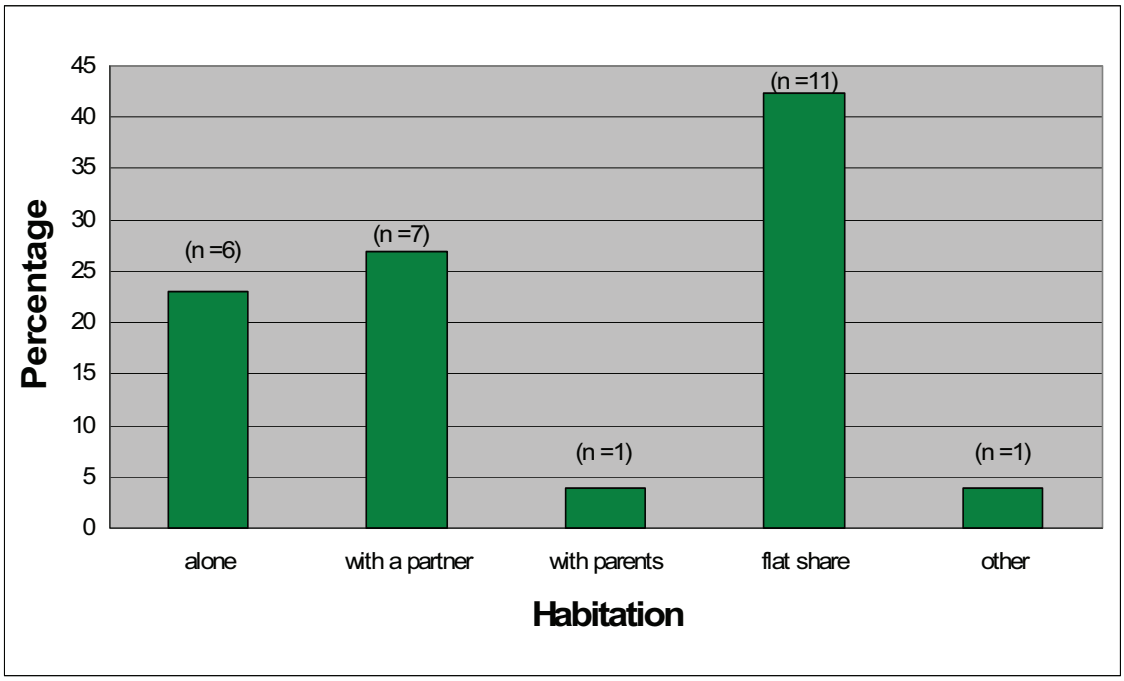


Figure 13: Habitation of study participants

The answering option 'other' left room for new and not considered habitation. The study participant who chose this answering option was living with a child.

However all habitation alternatives were represented in our study sample even if not equally distributed.

4.2 FFQ vs. WFR

4.2.1 Total dietary energy intake: FFQ

The total dietary energy intake was calculated per day (kcal/d) for each subject from answers determined by the semi-quantitative food frequency questionnaire. As described previously the quantity (g) times the energy content of that food or food group (kcal/g) was multiplied by its frequency (calculating the daily intake) of use. All energy consumed from a specific food or food group per day were then added up to the total energy intake per day (kcal/d).

The mean energy intake determined from the FFQ was 1999kcal per day for both sexes. The standard deviation was found to be 1044kcal per day. The lowest value of kcal per day was 816kcal and the highest 5019kcal.

The maximum energy intake of a study participant of 5019kcal might seem unrealistic high however; it should be included to show how overestimation of energy intake when self-reporting might mislead to falls assumption. This particular study participant had a correspondingly high energy intake determined from the WFP and was therefore not excluded from the study.

On the other hand a participants lowest energy intake of 816kcal might be an example of a self-reported underestimation. The corresponding ascertained energy intake from the food frequency questionnaire was similarly low. Although no consultation with the study participant was conducted it is believed that the study participant was on a diet when completing the weighed food frequency questionnaire as well as the weighed food record. This untypical low energy intake therefore does reflect the eating habit similarly among both dietary assessment methods. It was not believed that the study participant misreported data and therefore was included in the validation study.

4.2.2 Total dietary energy intake: WFR

The mean energy intake calculated from the weighed food record was 2199 ± 849 kcal/d (mean ± SD) for both sexes. The minimum energy intake from a study participant was 683.3 kcal per day and the maximum 3855.5 kcal per day.

4.2.3 Comparison of both dietary assessment methods

The median energy intake of both dietary assessment methods seemed slightly different. In the WFR the reported median energy intake of all study participants was higher compared to the FFQ.

The interpretation might lead to the suggestion that the FFQ is a dietary tool where the study participants underestimate their true energy intake, or that the WFR is a tool that overestimates the true dietary energy intake.

4.2.3.1 Overall comparison regardless of gender differences

Although it is important to see the difference of energy intake when considering gender aspects, the dietary assessment tool developed in this paper should be validated for male and female combined. It seems essential to compare both dietary assessment methods regardless of gender first to make a more general assumption of the FFQ's use among the Austrian population.

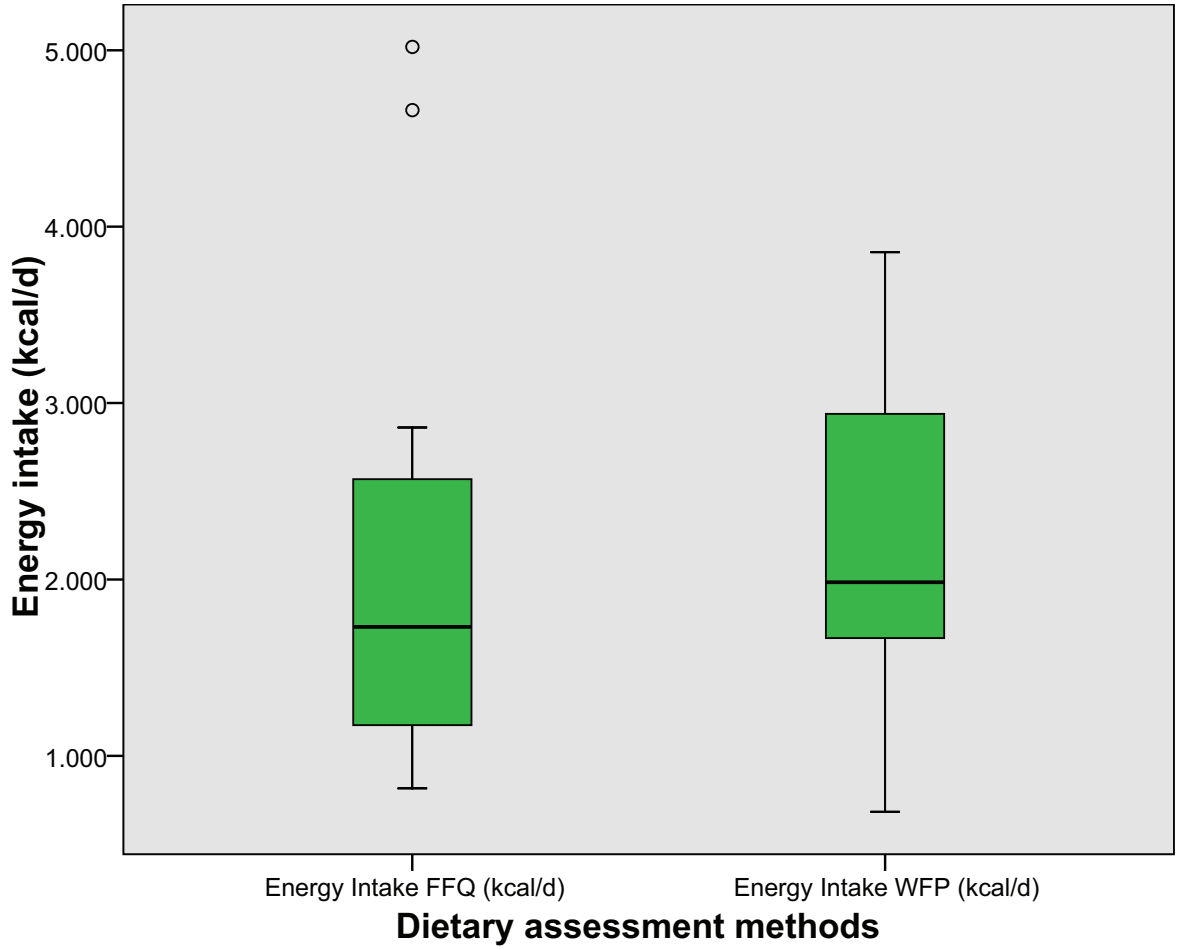


Figure 14: Boxplot of energy intake comparing FFQ and WFP regardless of gender

Figure 14: Boxplot of energy intake comparing FFQ and WFP regardless of gender) shows the differences of the specific dietary assessment methods. It is notable that both assessment methods have a similarly wide interquartile range.

The FFQ dietary assessment method however describes a lower overall energy intake of the study participants, with a few extremely high values as exceptions. The bottom scores of both dietary assessment methods seem correspondingly low. The upper end of the top 25 percent however represents completely different values. The energy intake observed from the FFQ gives greater ranges between the highest and lowest energy intakes compared to the WFP.

The FFQ had extremely high values of energy intake, which not so much observable among the WFR. The FFQ's self-reported energy intake estimations seem to be more open to variety compared to the observations when weighing of foods eaten.

The study participants who greatly overestimated their energy intake when self-reported show the weaknesses of the FFQ. Wrong potential energy of foods used in the calculation or the simple cause of misreporting knowingly or unknowingly could be reasons for the two outliers in our study. Estimation is difficult because it includes the combination of estimation of frequency and portion size. Both variables are open to interpretation and therefore could be sources of errors.

4.2.3.2 Gender differences

When looking at male and female separately their mean energy intake was slightly different.

When looking at the FFQ the female study participant had a average 1570 ± 608kcal/d (mean ± SD), male an energy intake of 2586 ± 1245kcal/d (mean ± SD). The gender differences are explained previously due to an elevated basal metabolic rate among males. Female study participants' energy intake was placed between the lowest numbers of 816kcal per day to a maximum of 2861kcal per day. Male energy intake ranged between a minimum of 1176kcal per day to a maximum of 5019kcal per day.

As well as the results from the food frequency questionnaire the gender difference among food and energy consumption is noticeable when looking at the WFR. The female's mean energy intake from the weighed food protocol was 1691 ± 457kcal/d (mean ± SD). The highest energy intake from a female participant was 2376kcal per day, the lowest 683kcal per day. The male study participants on the other hand had a mean energy intake of 2892 ± 771kcal/d (mean ± SD) with a minimal energy intake of 1537kcal per day and a maximum of 3856kcal per day. The elevated energy intake of male study participants compared to the female study participants is also observable in the dietary assessment method of the weighed food record.

Figure 15: Boxplot of energy intake comparing FFQ and WFP split by gender) shows the lower energy intake comparing both dietary assessment methods among women. It gives a rough overlook of the obvious energy intake differences between male and female.

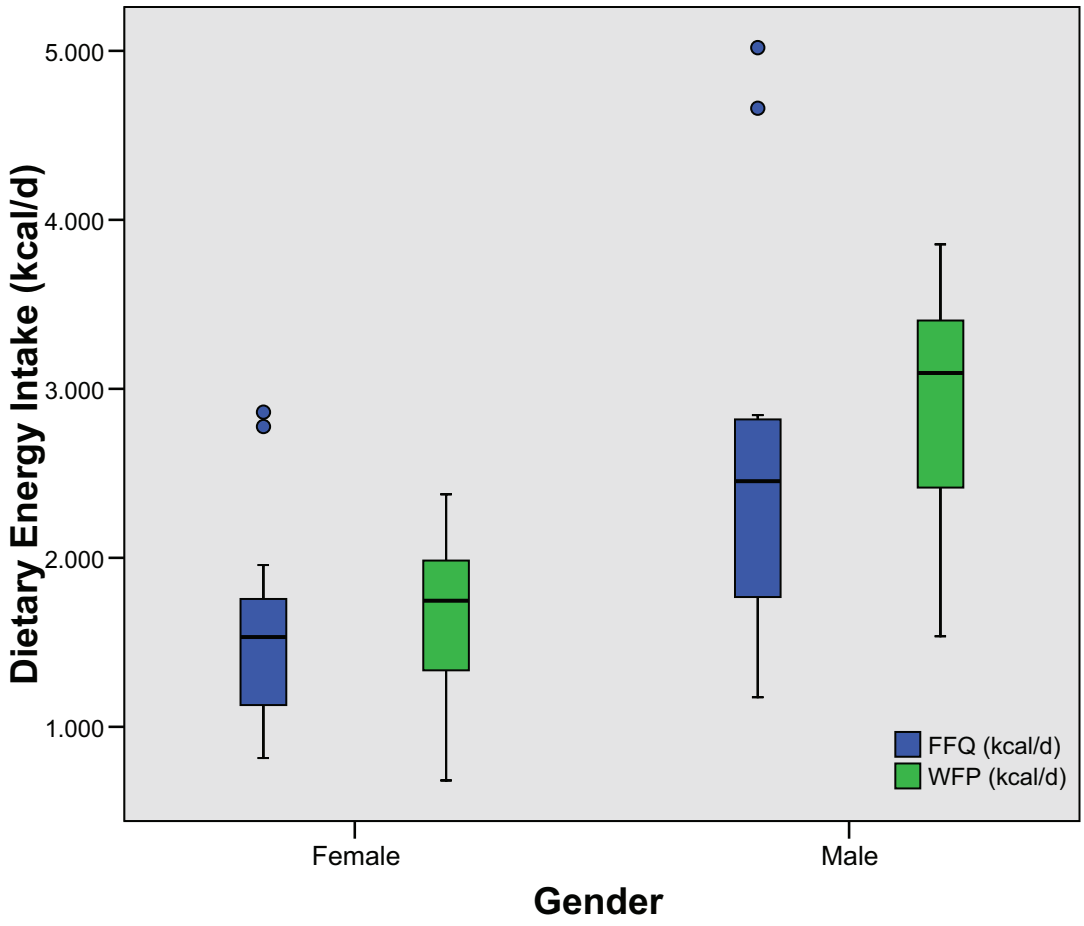


Figure 15: Boxplot of energy intake comparing FFQ and WFP split by gender

The median energy intake for women when choosing data from the WFP is 1709kcal per day respectively compared to the same figure taken from the FFQ with 1540kcal per day. The median energy intake among women is 169kcal per day lower when reported from the FFQ compared to measurements from the WFP. Even more drastic observations are drawn from the comparison of both dietary assessment methods among men. The median energy intake determined from the WFP is 3094kcal per day; the median energy intake determined from the FFQ is 2454kcal per day. This leaves a discrepancy of both dietary assessment methods of 640 kcal per day among men.

The boxplot shows that there are two outliers among both sexes which have a higher total energy intake than the rest of the study participants. When comparing both dietary assessment methods regardless of gender differences

only two outliers were visible. The female outliers were falling into higher energy intakes among males and could therefore not be seen. Whether these study participants just greatly overestimated their intake when looking at the FFQ or whether the FFQ and therefore their long-term energy intake represent the true situation shall be explored when calculating the relationship, the correlation coefficient for both dietary assessment methods.

To undermine visual interpretation with statistical significance the U-test after Mann and Whitney was performed. The energy intake among women did significantly differ from the energy intake among men when looking at both dietary assessment methods separately. The significant difference among genders was represented when looking at the FFQ, $U=34.00$; $z = -2.5$, $p < 0.05$, $r = -.49$. The significant difference among men and female was even greater when looking at the WFP, $U = 16$, $z = -3.5$, $p < 0.01$, $r = -.67$.

When comparing the ranges of energy intake between male and female participants it is notable that male study participants tend to have a higher variety in energy intake than female study participants. Their interquartile range among men is higher in both dietary assessment methods than among women. If this reflects the true situation among the Austrian people should be left open. It cannot be clarified as the study sample was too small to make general assumptions.

4.3 Correlation

The statistical analysis using the correlation coefficient was used to explore the coherence between both dietary assessment methods. In order to validate the developed semi-quantitative food frequency questionnaire a comparison with another dietary assessment method measuring the same outcome needed to be conducted.

The mean energy intake per day calculated from the FFQ should be compared to the mean energy intake per day determined from the WFP for each study

participant. This comparison can be achieved through calculating the correlation coefficient.

4.3.1 Spearman's correlation coefficient

The Spearmen correlation coefficient of energy intake (kcal/d) between the FFQ and the WFP appears to be significantly positive related, $r = 0.621$, $p < 0.01$. The positive correlation illustrates the higher the energy intake from the FFQ is to be found the higher the energy intake from the WFP is and vice versa.

The Spearman correlation coefficient of 0.621, $p < 0.01$, represents a medium correlation between the FFQ and the WFP. The developed FFQ gives a good quantitative measurement of the dietary energy intake per day among the Austrian population. Compared to other validation studies described in the literature review, the correlation coefficient determined in our study seems to be in the range of a reasonable good outcome. Even lower correlation coefficients in other validation studies recommended their developed dietary assessment tool to be sufficient tested and ready for use.

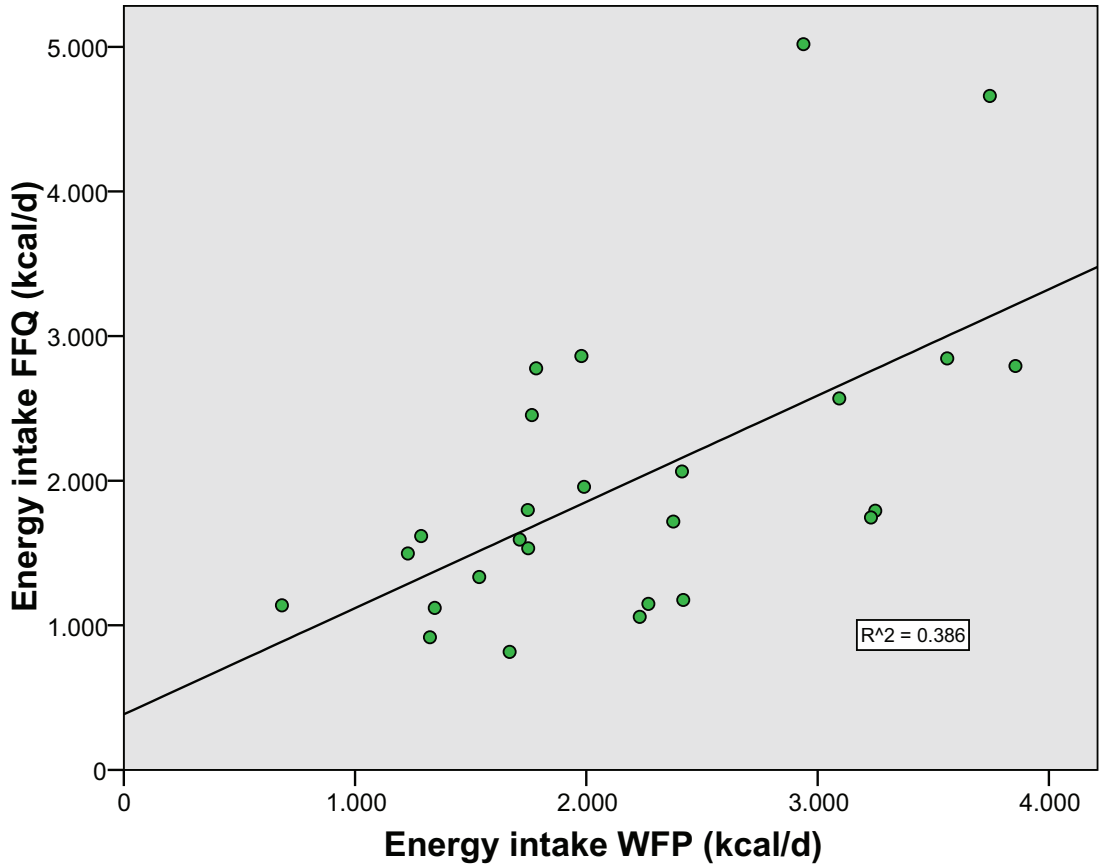


Figure 16: Bivariate plot of average energy intake (kcal/d) estimated from the FFQ vs. energy intake measured form the WFP

As both dietary assessment methods should measure a similar energy intake when conducted among one person, the result seems plausible. Ideally a correlation of 1 should be expected when both dietary assessment methods would measure exactly the same. As this is a study with many influencing variables a correlation coefficient of 1 would be unrealistic to expect. The bivariate plot of energy intake comparing both dietary assessment methods is represented in figure 16. Ideally all dots should form a straight line.

Another way to express our result other than the correlation coefficient would be the coefficient of determination. The coefficient of determination (R^2) is a measure of the amount of variability in one variable that is shared by the other. It can be calculated by squaring the correlation coefficient. For the specific non-parametric variable it is the proportion of variance in the ranks that is shared by

two variables [FIELD, 2009]. For our study it means that energy intake from the FFQ shares 38,6 % of the variability in the ranks from the energy intake determined from the weighed food record.

Although the correlation coefficient seems to be a good way to test the coherence of two measures it still has its limitations. To overcome the limitations of the correlation coefficient another way of comparing two methods measuring the same outcome, the 95% limits of agreement, was carried out.

4.4 The 95% limits of agreement

For our data sets the difference between the energy intake measured by the FFQ and the energy intake measured by the WFP was calculated. The normal distribution of the difference measured by both dietary assessments was tested by the Kolmogorov - Smirnov test. The data set was significantly, $D(26) = 0.08$, $p > 0.05$, normal distributed and therefore the requirements of the 95% limits of agreement were met. A histogram and Q-Q plot just undermined the statistical output.

The Bland and Altman plot shows the differences between energy intakes (kcal) measured by the FFQ and energy intakes (kcal) measured by the WFP plotted against the mean measurement (energy intake from the FFQ and the WFP). The difference of both dietary assessment methods was calculated by subtracting the energy intake measurements by the WFP from the energy intake measurements by the FFQ for each study participant (kcal/d from FFQ – kcal/d from WFP). The mean energy intake from both dietary assessment methods was calculated by dividing the sum of the energy intake from the FFQ and from the WFP by two for each study participant.

The Altman and Bland plot shows that for 95% of individuals, a measurement by the FFQ would be between 1899kcal per day less and 1500kcal per day greater than a measurement by the weighed food protocol. Or in other words if a subject would be selected randomly from the general population the

differences between both dietary assessment methods would be expected to lie within the limits of agreement with approximately 95% probability.

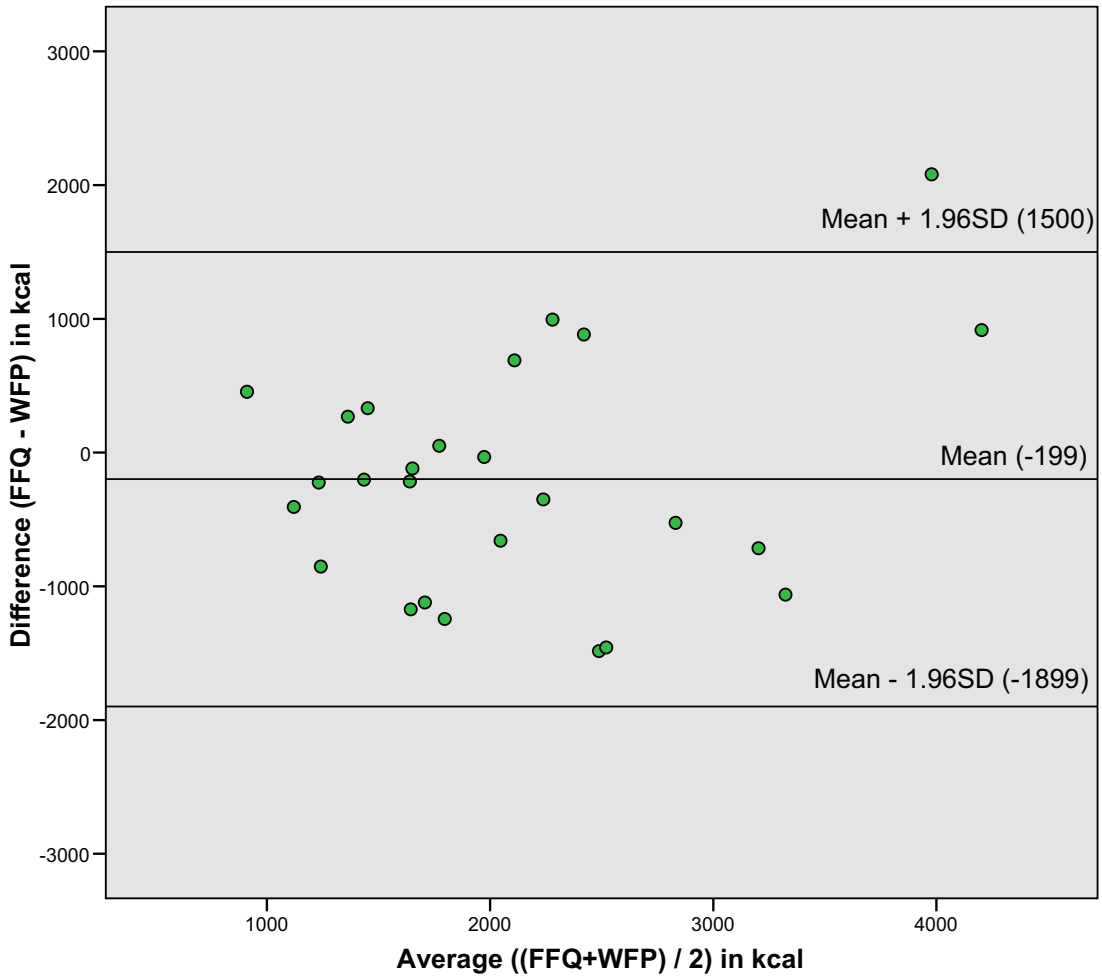


Figure 17: Bland and Altman plot of differences between energy intakes (kcal) measured by the food frequency questionnaire (FFQ) and energy intakes measured by the weighed food record (WFR) plotted against the mean measurement (energy intake from the FFQ and the WFR).

If both methods would measure exactly the same the mean difference would be 0. Ideally the dots would form a close range around the mean difference line drawn on the y-axis.

The mean difference of both dietary assessment methods, however, was -199kcal per day with a standard deviation of plus or minus 867 kcal per day.

The average underestimation of the FFQ compared to the WFP would be 199kcal per day. However in our study the average energy intake when observed from the FFQ is slightly lower than the energy intake when observed from the WFP. A systematic error shifts the average difference value to minus 199 kcal per day. Although the prevalence of underreporting energy intake from the FFQ is obvious it might coexist with over reporting when comparing measurements to the weighed food record.

The large range of the standard deviation from the differences between the dietary assessment methods shows another picture than when looking at the correlation coefficient. The Bland and Altman plot demonstrates a lack of agreement between energy intake determined from the FFQ and the WFP.

The wide range of the average comparison measured through both dietary assessment methods represents the random error. It is obvious that there is a big inter-individual variation among the total energy intake of the study participants. The average values of both methods lie somewhere between 1000kcal/d to a little over 4000kcal/d. Different energy intakes however are not surprising because the study participants are a heterogeneous group of individuals with different PAL, height and weight.

Subjects with a lower average dietary energy intake from both dietary assessment methods tend to have a higher accuracy between the methods. Subjects with a higher average dietary energy intake, lets say above approximately 2000kcal per day, assessed from both dietary assessment methods on the other have showed a bigger discrepancy between the methods.

Although the Spearman correlation coefficient of $r = 0.621$, $p < 0.01$ indicates a moderate correlation between the FFQ and the WFP, the Bland and Altman plot shows the systematic error as well as the random error and therefore the agreement, the interchangeability between both methods. As all study participants except one are within the 95% limits of agreement, the developed

FFQ seems to be a highly valid assessment tool. On the other hand the wide range of the confidence interval could be narrowed by a bigger sample size and would probably produce different results.

The conclusion of the Bland and Altman plot would demonstrate the under reporting of mean energy intake by the FFQ compared to the reported energy intake from the WFP. Also the specific differences between the FFQ and the WFP from all subjects did underline variation between both dietary assessment methods.

4.5 Influencing factors on the energy intake

In our study, demographic, anthropometric, and social characteristics data were collected to include influencing factors when assessing dietary energy intake. All influencing factors were tested for the FFQ as well as for the WFP.

It has already been shown and discussed that the gender aspect greatly influences the energy intake. This significant difference was observed in both, the FFQ and the WFP.

Other studies confirm our findings of gender differences among dietary behaviour. In a community based sample of 96 Australian adults not only the consumption rate, but also the choice of foods were influenced by gender. 17 food groups (out of 37) were significantly associated by sex [MARKS et al., 2005]. It undermines the great importance to obtain further information of male and female's eating habit when assuming diet related diseases.

The energy intake among people who earn less than 1000 Euro did not differ significantly form people who earn more than 1000 Euro when observed from the FFQ ($U = 77.00$, $z = -.05$, $p > 0.05$, $r = 0.01$) and the WFP ($U = 71.00$, $z = -.38$, $p > .05$, $r = -.08$). No difference among both dietary assessment methods could be observed when distinguishing between income categories.

In the contrary a study in France conducted that economic constraints play a role in the high prevalence of obesity in low-income households. They suggest that these low-income households prefer energy dense foods and therefore the income does correlate with dietary energy intake [DARMON N, 2003]. As our study participants did not suffer from acute economic constraints general assumption on very low income households could not be made.

Considering the habitation of the study participants the influence of such on the dietary behaviour should be explored. The study participants were put into two groups, single household habitation and family, community, non-single habitation. There was no significant difference between the total dietary energy intakes among single living individuals compared to community living individuals. This was observed similar from the FFQ ($U = 50.00$, $z = -.61$, $p > .05$, $r = -.12$) and the WFP ($U = 46.00$, $z = -.852$, $p > .05$, $r = -.16$). Habitation among our study participants can therefore not be seen as an influencing variable of daily energy intake.

Our study participants consisted mainly of normal weighed individuals. Therefore the overweighed subjects built a minority. A representative comparison of normal weighed to overweighed individuals considering the total dietary energy intake was quite impossible among the study participants. It would make sense that people who have a BMI above 24.9 kg/m^2 have a higher energy intake than people with a BMI considered as normal weight. The difference of total dietary energy intake amid normal or underweight subjects compared to pre-obese individuals was not significant when calculated from the FFQ ($U = 29.00$, $z = -.44$, $p > .05$, $r = - .09$) or observed from the WFP ($U = 34.00$, $z = - .40$, $p > .05$, $r = -.01$).

Although the outcome does not seem plausible it was undermined with an Australian study of 96 individuals. They could not find any association between the BMI and food items. However the quantity of each food eaten was not

assessed and therefore the correlation between energy intake and BMI can not be clarified [MARKS et al., 2005]..

The occurance of an elevated BMI can have many causes. As discussed in the literature overview, the Austrian population has not experienced an increased energy consumption rate over the last years. However it was observable that the Austrian population's prevalence of obese and pre-obese individuals increased [ELMADFA et al., 2009a]. The causal relationship between energy intake and an elevated BMI might therefore be also influence by an inactive and sedentary lifestyle due to the rising urbanization of the world's population. The increased availability of food supply is only a part of the causal pathway [GRUNDY, 1998].

The BMI among our study participants however cannot be seen as an influencing factor on the energy intake. The reason for it might be an unrepresentative sample size or other factors which contribute to an increased BMI except total dietary energy intake such as physical activity.

A similar scenario was observed when using age as a modifying factor. Our study participants consisted mainly of young adults below the age of 30 (20 subjects). The elderly group (6 subjects) was not represented evenly to observe significant differences of dietary energy intake. It was similar examined in the FFQ ($U = 38.00$, $z = -.43$, $p > .05$, $r = -.08$) and the WFP ($U = 30.00$, $z = -.99$, $p > .05$, $r = -.20$). Age was not a determining variable to change dietary energy intake in our study participants.

The reference values from nutritional boards from Germany, Austria and Switzerland for mean energy intake for different age groups contradict our outcome. Due to a decrease in active cell mass the BMR declines for men after the age of 25 and for women after the age of 19. This physiological change lowers the recommended daily dietary energy intake for both sexes with an elevated age [DACH, 2008].

The comparable low represented older age group or the ignorance of recommended energy intake of our study participants could be reasons for age not to be a determining variable considering dietary energy intake.

Did the educational level play a role in a different dietary energy intake among the study participants? The study did not include people with only a primary education, therefore only a comparison between subjects with a secondary and a tertiary education was possible. Also in this example there was no significant difference in the total dietary energy intake among subjects with a secondary and subjects with a tertiary education observed from the FFQ ($U = 62.00$, $z = -.56$, $p > .05$, $r = -.11$) and the WFP ($U = 67.00$, $z = -.28$, $p > .05$, $r = -.05$). It might be explained when knowing that most study participants who currently had a secondary education were aiming to achieve a tertiary education. Maybe the sector of people with a secondary education was not correctly represented and therefore no difference was to be found. Maybe no difference in the energy intake was found because the poorly educated individuals were not represented. Maybe the educational level among higher educated individuals really does not influence the energy intake.

Some studies expected an inverse relationship between the educational level and the BMI. The lower the educational level was assessed, the higher the BMI was to be found [RODRÍGUEZ – MARTÍN et al., 2009]. If only the energy intake is responsible for an elevated BMI among poorly educated individuals shall be left open. Maybe an inactive lifestyle and a lack of knowledge for good health contribute to the high BMI.

Dietary energy intake was or was not influenced throughout both dietary assessment methods, the FFQ and the WFP, from specific variables in the same way. A significant difference in the total dietary energy intake was only observed between men and women. All other factors such as habitation, BMI,

income or age did not significantly influence the energy intake of our study participants.

4.6 Constraints of the developed FFQ

4.6.1 Representativeness

The sample size was selected conveniently. Because of the uneven age, education and nutritional status distribution of the study participants the sample is not representative for the Austrian population. A validation study however only compares two methods measuring the same outcome. The sample does not necessarily have to reflect the Austrian population. It should measure the same outcome regardless of the population. The outcome can therefore be seen as valid even though the Austrian population was not represented completely. However, coherence might be different for other samples and therefore the FFQ should be tested in a pre-test in the target population before conducting a bigger study.

4.6.2 Seasonal differences

The validation study started in March 2009 and ended in September 2009. The FFQ was designed to capture the past 6 months of dietary behaviour, without considering seasonal differences. All foods were included in the FFQ that contributed to the Austrian diet regardless of specific seasonal trends.

The study results, however, did not represent the whole year. The study was conducted between March and September and therefore only dietary behaviour of spring and summer were presented. As an example Christmas pastries included in the FFQ were hardly ever eaten during that time frame among the study participants. On the other hand ice cream and donuts were consumed quite frequently. It is obvious that the dietary behaviour changes throughout the seasons.

To make more general assumptions the FFQ would need to be validated for autumn and winter as well. Further investigation and a new validation approach

would be necessary to develop a semi-quantitative FFQ for the whole year. A new validation approach, however, would not need to change the already developed FFQ as all seasonal foods were included; the study the key foods are based on was representative for each seasons of the year.

To weaken the argument that the developed FFQ is validated only for spring and autumn a study in the Netherlands presents interesting results. The seasonal dietary behaviours of 114 young adult women were examined through fourteen 24h – recalls. The study did not demonstrate seasonal variation in the mean energy intake of the study population. However the intake of fat appeared to be lower in the summer and spring than in the winter and autumn; the intake of mono- and disaccharides were reversely higher in the summer and spring than in the winter and autumn [STAVEREN et al., 1986].

If there truly is no difference in the dietary energy intake throughout the seasons the developed FFQ would gain even more reliability throughout the year. As the study conducted in the Netherlands [STAVEREN et al., 1986]. seems already antiquated new evidence needed to be conducted to undermine the argument.

Therefore it can be concluded that the developed FFQ can be seen as validated for spring and summer, but still can be used throughout the year.

4.6.3 Interpretation of Frequency and Portion Size

Frequency questions in the FFQ, how often a food item or food grouping was consumed, included 9 answering options in an ascending order. Although information to fill out the FFQ correctly was included, the study participants were confused about the gap between the option ‘never’ and the option ‘once a month’. They were asked to check the box ‘never’ if they were consuming a food item less than once a month. However, the completion of the FFQ seemed clear, to some study participants it did not. For the final use of the FFQ the box ‘never’ should be rephrased to ‘never or less than once a month’. The other

answer options were arranged continuously to leave no room for interpretation and missing values.

Portion Sizes were tried to be as exact as possible. In most cases weights in grams were included to assess the exact amount consumed. In order to be as precise as possible a high concentration of the participant was demanded when filling out the FFQ. It seemed difficult for many participants to estimate the weight consumed. Therefore also household used portion sizes were included. This led to very complex questions. Sometimes not only a single food item, but also a grouping of different foods in one question complicated the portion size estimation.

For a correct completion of the questionnaire the participant had to be highly motivated and willing to think exactly when estimation his/her average food intake.

Maybe future modifications of the FFQ could simplify some very complex questions down to easier, shorter once. This however would greatly affect the length of the already very time consuming questionnaire. Depending on the studied population this might have its advantages.

4.6.4 Food grouping problem

The interpretation of study participants when choosing a portion size left room for error, but also the calculation of portion sizes. Specific questions in the FFQ not only included a single food item, but sometimes also the assembling of food groups was necessary to shorten the questionnaire.

The average weight of a food group was calculated. Wrong values form literature, the BLS or self-weighed measurements could cause a misleading estimate of the portion sizes. A question with many different food items combined could therefore have many sources of error. To find the influencing

variable seems very difficult to determine due to the high aggregation of data in one question.

Not only the portion size, but also the energy content of food groups can be susceptible to error. Energy content values were taken from the BLS. Energy density of foods (kcal/100g) was calculated by the mean of food items within a food group. The calculations included the frequency and amount of the food consumed from the Austrian population. The weighting of foods items after their energy contribution to the diet enabled a better calculation of a representative average energy density of that food group. It led to a more precise value of the energy content of a food group. However, the calculations could be based on data with errors.

The grouping was chosen randomly after similar energy density of foods and their portion sizes. Maybe a different grouping of food items would ease the completion of the questionnaire. A compromise of a short and simple questionnaire with the incorporation of 397 foods was difficult to achieve. Future changes among the FFQ could rearrange food items for a better incorporation of foods consumed. This however seems to be a very subjective choice and is therefore more so prone to include imperfections.

4.6.5 Underreporting

Underreporting is the biological not plausible report of dietary intake level given an individuals physiological status and physical activity level [BOTHWELL et. al., 2009].

The validity of self reported measures should always be examined carefully. Underreporting among dietary assessment methods is a main concern in nutritional epidemiologic research. Underreporting may result from various factors. It may include deliberate or inadvertent omission of consumed foods. To detect the target group of underreporting individuals, literature has shown that underreporting occurs mainly among obese, older, less educated and poor

females [BOTHWELL et al., 2009]. If those studies among white populations [BOTHWELL et al., 2009]. reflect the true situation our study population would not be likely to include individuals who underreport their food intake. Although our study population consisted of female individuals they were highly educated, young, normal weight and most of them were not poor. The underreporting rate would therefore be diminishing small in our study sample.

Underreporting of food intake threatens the validity of dietary assessment methods [BOTHWELL et al., 2009]. It is however controversial which dietary assessment method provides greater underreporting rates [SCAGLIUSI et al., 2008]. The weighed food record does not depend on the memory. The FFQ on the other hand is open for interpretation and depends entirely on the memory which could lead to imprecise estimations. In our validation study the individuals had to reconstruct dietary behaviour over the last 6 months. Even if not intentionally it seems difficult to not over- or underestimate true food intake. As already described in the literature overview section of this paper the choice of dietary methodology always depends on the aim of the study as well as on the resources of the researcher. Before choosing a dietary assessment method all advantages and disadvantages have to be weighed carefully.

A Brazilian study of 65 female subjects tried to explore the extent to which dietary assessment methods underreport energy intake. Their main measures were three 24h - recalls, a 3 day weighed food record and a food frequency questionnaire. All three dietary assessment methods were compared to a biochemical marker using doubly labelled water. The total energy expenditure determined through the double labelled water was compared to the mean energy intake determined from the other dietary assessment methods [SCAGLIUSI et al., 2008].

The outcome of the study suggested that all energy intake values significantly differed from the total energy expenditure. All values of energy intakes were lower then the total energy expenditure when determined through the double

labelled water. This leads to the suggestion that those three dietary assessment methods generally underestimate the true dietary energy intake [SCAGLIUSI et al., 2008]. The underreporting of energy intake appeared to be more in obese subjects than in normal weighed ones. Income and education were associated with reporting accuracy. This would lead again to the conclusion that our study participants were not a representative group of individuals who underestimated their food intake [SCAGLIUSI et al., 2008].

The FFQ produced greater under- and overestimation of energy intake compared to the other dietary assessment methods in the Brazilian study [SCAGLIUSI et al., 2008]. The FFQ from our validation study produced as well a greater range of energy intake values than the 3 day weighed food record. It shows that the developed FFQ seems to be not as accurate as the 3 day weighed food record. Because of this circumstance the more accurate 3 day weighed food records was used to validate our FFQ. Literature [SCAGLIUSI et al., 2008]. has shown that our study participants are not likely to underestimate food intake. However the picture in Austria could be a different one.

One explanation of a lower energy intake found from the FFQ could be that not all foods were included that contribute to the overall energy intake. As described in the methods chapter more than 90% of foods contributing to the energy intake were included in the FFQ. The other 10% were not. If 10 % of foods consumed in an Austrian diet were not included the energy intake from the FFQ had to be lower than the energy intake determined from the WFP. A correcting factor could eliminate the discrepancy on a population level.

But not only the under reporting seems to be a concern, the wide range of the differences of both dietary assessment leads to the suggestion of a coexistence with over reporting of energy intake when comparing measurements to the weighed food record. This however can not be said for certain because dietary assessment methods when self reported can not be verified and are therefore always open for errors. A second validation with a biochemical marker might

have been useful for the elimination of the subject's personal influence on the study results.

When the resources are limited, as in our case to only dietary assessment methods, a compromise of the best available methods needed to be accepted.

4.6.6 Correlated errors

The validity of the developed semi-quantitative FFQ was assessed using a superior, more exact although always imperfect standard, the 3 day weighed food record. The 3 day weighed food record was used as a so called 'golden standard'.

It has been said that there is no perfect method to measure dietary intake, with the implication that validation studies are not possible. A measurement error is however not unique to dietary intake methods; all measurements have error. The magnitude of errors differs within measurement methods [WILLETT, 1990]. Validation studies therefore never compare a developed method with absolute truth. They much rather compare one method with another method that is rated to be superior. It is therefore essential, as neither method is perfect, that the errors of each method to be as independent as possible. This avoids spuriously high estimates of validity [WILLETT, 1990].

For example a comparison of our developed FFQ with a diet history interview would not have been reasonable. It would have provided a very limited assessment of validity. Both methods have similar sources of errors as they both consist of a questionnaire. They depend mainly on the memory, the interpretation of each question could be different, and the perception of the serving sizes could be major sources of errors. One error in one method would be likely to be replicated in the other method, which would lead to a false high validity of the newly developed method.

To avoid the problem of correlated errors best we used a 3 day weighed food record to validate our developed FFQ. Among the available dietary assessment methods for validating a FFQ the weighed food record is likely to have the least correlated error [WILLETT, 1990].

The FFQ imposes major errors due to the restrictions in the variation of the fixed food list, the memory, the interpretation of questions and the different perceptions of portion sizes and frequency options [WILLETT, 1990]. To minimize the errors among the portion size perception we added the exact weighed of most portion sizes to each question in our FFQ. The errors from the FFQ are usually not shared with the weighed food record which gives specific information about portion size, no records depend on the memory of the participant and the interpretation clearly depends on the dietician coding the records because of its open questions and not on the participation's interpretation. Due to a lack of correlated errors between the FFQ and the WFR the validity tends to be understated [WILLETT, 1990].

Even though most errors are uncorrelated between the FFQ and the WFR, the source of the food composition data is not [WILLETT, 1990]. The energy intake calculated from the FFQ and the WFR were based on the nutrient content published in the BLS. If the published data from the BLS for energy intake varies greatly for different foods, the calculated values from the weighed food record may be incorrect but still correlate with the FFQ. Both methods would therefore be incorrect due to the nutrient composition databank being unrepresentative of the foods that were consumed. However, impossible to correct the influencing variable it is important to notice it.

On the other hand if two nutrient composition databanks would be available and there would be a great difference between the nutritional assessment methods it could not be said for certain if the difference comes from the used databanks or if the methods really do not agree. Maybe the use of one single nutrient databank is the only solution when comparing dietary assessment methods.

Nevertheless it has its limitations. The lack of a perfect comparison method with no correlated errors indicated the sustained need to look for a better golden standard.

Maybe the validation of a FFQ with another external validation instrument would be the best solution in addition to other dietary assessment methods. This paper focuses only on the total dietary energy intake. A specific biochemical marker for energy intake is the doubly labeled water. It should be the golden standard technique for total energy expenditure assessment and can be used as an unbiased reference biomarker for energy intake [SCAGLIUSI et al., 2008].

However, given the financial resources and time frame the use of a WFR to validate a FFQ seemed to be the appropriate choice. Maybe future research could enhance the validity among our developed FFQ and the WFR with the use of a biochemical marker.

5 Conclusion

The aim of this paper was to develop and validate a dietary assessment tool to measure total energy intake based on an Austrian diet. The validation process included the completion of a 3 day weighed food record as well as the developed semi-quantitative FFQ from 26 study participants. The Spearman correlation coefficient of 0.621, $p < 0.01$, represented a moderate correlation between the FFQ and the WFR. The developed FFQ gave a good quantitative measurement of the dietary energy intake per day when assessing the Austrian diet.

Limitations of the FFQ were shown in the Bland and Altman plot. A systematic error suggests the underreporting of dietary energy intake from the FFQ compared to the WFR by 199kcal/d. Taking into consideration a possible underreporting when using the newly developed semi-quantitative FFQ is advisable. However a correcting factor could give reliable estimations of the energy intake when assessing food intake on a bigger population.

Some outliers with extremely high values of energy intake summarize the difficulty of estimating dietary energy intake when self reported. The knowledge of possible errors among dietary assessment methods need to be apparent when using such an instrument. Considering the imperfection of dietary assessment methods and knowing their weaknesses prevents wrong assumptions and is necessary when making recommendations related to diet and health.

The completion of both dietary assessment methods was conducted between March and September 2009. The developed FFQ can only be seen as validated for spring and summer, but still can be used throughout the year.

A comprehensive list of foods, assessing at least 90% of total dietary energy intake, made it possible to determine usual dietary energy intake based on an

Austrian diet. Future modifications of the FFQ might simplify some complex questions so that people are more likely to give them their full attention. This would greatly affect the length of the already very time consuming questionnaire. Depending on the studied population, the advantages might be very worthwhile.

Correlated errors between the semi-quantitative FFQ and the weighed food record could produce wrong results. Although the weighed food record seemed to be a good validation instrument with little common errors it still has its limitations. The electronic nutrient databank, BLS, used for calculations among both dietary assessment methods could include false data and lead to correlated errors. However, the use of a weighed food record to validate a FFQ seemed to be the appropriate choice.

Future research could enhance the validity among our developed FFQ and the WFR with the use of a biochemical marker. A biochemical marker assessing total energy expenditure by double labelled water could serve as a comparison to validate total dietary energy intake measured by the FFQ.

Personal characteristics influencing dietary energy intake were determined. Dietary energy intake was or was not influenced throughout both dietary assessment methods, the FFQ and the WFR, for specific variables in the same way. A significant difference in the total dietary energy intake was only observed between men and women. All other factors such as habitation, BMI, income or age did not significantly influence the energy intake of the study participants.

The development and validation opened new approaches for the improvement of legitimacy. The choice of the right validation instrument as well as the incorporation of food items among the FFQ are susceptible to errors. Considering the weaknesses and improvement options the developed FFQ gives a good foundation for a valid dietary assessment tool among the Austrian population.

6 Summary

Objective: To develop and validate a semi-quantitative food frequency questionnaire (FFQ) assessing total dietary energy intake based on an Austrian diet.

Design: The study included 26 study participants, not randomly recruited adults. Each study participant had to complete both, a semi-quantitative FFQ and a three day weighed food record (WFR) within March and September 2009. Energy intake was expressed for each study participant and each dietary assessment method in kcal per day.

Subjects: 15 women and 11 men from 20 to 51 years of age.

Setting: Vienna, the capital of Austria.

Results: Spearman correlation coefficient of 0.621, $p < 0.01$, represents a moderate correlation between the FFQ and the WFR. Mean energy intakes determined from the FFQ were found to be 1999kcal/d plus or minus a standard deviation of 1044kcal/d; minimum values of 816kcal/d, maximum values of 5019kcal/d.

Conclusion: The developed FFQ gives a good quantitative measurement of the dietary energy intake per day when assessing the Austrian diet between spring and summer. Underreporting might be evident when used among an individual however a correction factor could eliminated errors among a larger population. Future research using double labelled water could elevate the validity of the developed semi-quantitative FFQ.

7 Zusammenfassung

Zielsetzung: Die Entwicklung und Validierung eines semi-quantitativen Food-Frequency-Questionnaire zur Ermittlung der täglichen Energieaufnahme basierend auf einer österreichischen Ernährung.

Design: Durch eine willkürlich gewählte Stichprobe nahmen 26 Erwachsene an der Validierungsstudie teil. Jede/r Studienteilnehmer/in musste einen FFQ und ein 3-Tage-Wiegeprotokoll zwischen März und September 2009 ausfüllen. Die tägliche Energieaufnahme (kcal/d) wurde für jeden Studienteilnehmer und jedes Ernährungserhebungsinstrument ermittelt.

Studienteilnehmer/innen: 15 Frauen und 11 Männer, zwischen 20 und 51 Jahren.

Studienort: Wien, Österreich.

Ergebnisse: Der Spearman's Korrelationskoeffizient der täglichen Energieaufnahme beider Ernährungserhebungsmethoden lag bei $r = 0.621$, $p < 0.01$, und ergab eine mittlere Korrelation zwischen dem FFQ und dem Wiegeprotokoll. Die durchschnittliche tägliche Energieaufnahme ermittelt aus dem FFQ lag bei 1999 ± 1044kcal/d (Mittelwert ± Standardabweichung); das Minimum lag bei 816kcal/d, das Maximum bei 5019kcal/d.

Schussbetrachtung: Der entwickelte FFQ gibt eine gute quantitative Abschätzung der täglichen Energieaufnahme basierend auf einem österreichischen Ernährungsverhalten im Frühling und Sommer, kann jedoch über das ganze Jahr hinweg verwendet werden. Die individuelle Energieaufnahme wird durch den FFQ eher unterschätzt. In einer größeren Studienpopulation könnte dieser Fehler durch einen Korrekturfaktor behoben werden. Die Grundlagen für ein valides Ernährungserhebungsinstrument sind geschaffen worden; einige Limitationen sind jedoch zu berücksichtigen. Zukünftige Untersuchungen könnten die Validierung des entwickelten FFQ durch einen biochemischen Marker (double labelled water) erhöhen.

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Annex

Calculation of energy content of food items and food groups (kcal/100g)

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g)
2.1. Obst außer Bananen				
Apfel frisch	52	100510	5226508	**54**
Apfelkompott (5)	74	2354	174178	
Nektarine frisch	57	10310	587647	
Birne frisch	52	10221	531471	
Orange frisch	47	8641	406125	
Weintraube rot frisch	71	14059	998214	
Pfirsich frisch	41	5652	231726	
Weintrauben frisch	71	4638	329329	
Kiwi frisch	61	3351	204395	
Erdbeere frisch	32	3226	103245	
Mandarine frisch	50	3178	158875	
Melone frisch	38	2069	78626	
Mango frisch	60	1875	112500	
Aprikose frisch	42	1754	73647	
Ananas frisch	59	1653	97503	
Süßkirsche frisch	63	1569	98828	
Summe			175058	
2.2.1 Bananen				
Banane frisch	95	93128		**95**
2.3.1. rohes oder gedünstetes Gemüse				
Salat gemischt (ohne Marinade) (R)	29	11074	324054	**38**
Mischgemüse gedünstet (5)	53	22685	1202288	
Tomate rot frisch	17	9546	162279	
Gemüsesuppe klar (R)	29	6365	185656	
Gemüsepaprika grün frisch	20	2856	57116	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Tomatensauce (R)	32	2289	72458	
Gemüsepaprika gelb frisch	30	2159	64773	
Sauerkraut Wiener Art	56	2147	120031	
Rotkraut gedünstet (R)	50	1726	85459	
Karotte frisch	26	1663	43230	
Erbsen grün gegart	82	1640	134480	
Gemüsesuppe "italienisch" (Minestrone) (4)	38	1533	58265	
Summe			65682	
2.3.3 Gemüse als Cremesuppe, Sauce und/oder warmes Gerichte				
Cremespinat (R)	79	3468	272640	**97**
Karotten Wiener Art (R)	60	3393	204018	
Zucchinigemüse (R)	116	3372	389705	
Paprika gefüllt in Tomatensauce (R)	75	2935	221160	
Champignonsauce (R)	132	2022	266298	
Gemüsestrudel aus Blätterteig (R)	158	2013	318158	
Letscho (R)	78	1946	152633	
Zucchinicremesuppe (R)	81	1827	148593	
Gemüsesugo (R)	135	3802	512623	
Knoblauchsuppe (R)	68	2433	164865	
Summe			27211	
Salat				
Häuptelsalat (R)	116	70334	8164784	**96**
Salat gemischt (ohne Marinade) (R)	29	11074	324054	
Tomatensalat mit Essigmarinade und Zwiebeln (R)	52	8873	458689	
Gurkensalat (R)	71	6631	467914	
Bohnensalat mit weißen Bohnen (R)	129	2400	309986	
Krautsalat (R)	66	2173	143112	
Griechischer Bauernsalat (R)	48	1466	70460	
Chinakohlsalat (R)	61	1442	88375	
Summe			104393	
Kartoffel, gegart, geröstet, als Knödel und Brei				
Kartoffeln geschält gegart	69	28039	1934680	**91**
Bratkartoffeln (6)	108	27948	3018409	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g)
Kartoffelsalat mit Dressing (6)	107	13228	1415433	
Kartoffelbrei/Kartoffelpüree (0)	79	13139	1037953	
Röstkartoffeln (R)	107	4843	516165	
Petersilienkartoffeln (R)	100	3990	400548	
Kartoffelknödel (R)	85	1952	165756	
Summe			93139	
Kartoffeln als Puffer, Auflauf, Kroketten, Pommes				
Kartoffelpuffer (R)	124	1849	229122	**164**
Kartoffelkroketten	240	1644	394294	
Kartoffellaibchen (R)	169	1462	247107	
Kartoffelauflauf mit Bechamelsauce (R)	152	1947	296674	
Tiroler Gröstel (R)	147	2269	333229	
Summe			9170	
Chips				
Chips - Kartoffelchips (verzehrsfertig)	535	16585	8872975	**526**
Erdnußflips	529	1719	909483	
Popcorn (R)	487	3823	1861970	
Summe			22127	
Getreide-produkte				
Roggen- und Weizenmischbrot, Vollkornbrot				
Roggen/Weizen-Mischbrot mit Hefe	210	301175	63246677	**210**
Vollkornbrot	188	49634	9331169	
Vollkornteigwaren aus Weizen gegart Beilage (ohne Ei)	139	1877	260834	
Vollkornbrötchen(allgemein)	222	62733	13926673	
Vollkornbackwaren mit Ballaststoffen	436	1439	627317	
Vollkornbrot mit Sonnenblumenkernen	204	1428	291312	
Summe			418285	87683981

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Weißbrot, Weizenbrot				
Weißbrot-Weizenbrot	235	1739	408665	**247**
Weißbrot-Toastbrot mit Schrotanteilen	252	2772	698544	
Baguette	248	3095	767570	
Semmel	248	115884	28739282	
Weißbrot-Toastbrot	253	14067	3558900	
Weißbrot mit Schrotanteilen	234	10916	2554286	
Summe			148473	
Kabbergebäck, Salzstangerl, Laugengebäck				
Laugengebäck	340	7239	2461124	**331**
Knabbergebäck gesalzen (A)	340	5215	1773552	
Salzgebäck	347	2429	842863	
Salzstangerl (R)	233	1870	436168	
Knäckebrot leicht & cross	345	1725	595125	
Summe			18478	
Reis				
Reis Beilage m. Fett (R)	121	62350	7518104	**120**
Risotto (R)	145	3969	575846	
Risi Pisi (Erbsenreis) (R)	133	3925	520167	
Reis Beilage (R)	92	3636	334775	
Gemüsereis (R), JA'	111	2422	269778	
Milchreis (R)	101	2200	222462	
Summe			78502	
Müsli, Haferflocken, Cornflakes				
Müsli	351	29393	10316852	**354**
Cornflakes	355	4910	1742926	
Hafer Flocken	370	4433	1640062	
Summe			38735	
Nudeln, Lasagne, Eierteigwaren, Spätzle				

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Eierteigwaren gegart Hauptspeise	126	109702	13822439	**142**
Eierteigwaren gegart Beilage	126	22340	2814815	
Spaghetti alla carbonara (R)	220	21458	4730197	
Krautfleckerl (R), JA	117	3641	426883	
Nudelsalat Caprese (R)	151	3139	473598	
Nudelauflauf mit Gemüse, Käse und Schinken (R)	140	3004	419441	
Nudelauflauf mit Gemüse und Hackfleisch (R)	170	2951	500753	
Spätzle (in Butter geschwenkt) (R)	115	9344	1074048	
Käsespätzle (R)	106	4563	481528	
Eiernockerl (R)	202	4037	817058	
Kärntner Kasnudeln	228	2634	600300	
Nockerl (in Butter geschwenkt) (R)	192	1728	331892	
Lasagne mit Fleischsoße und Bechamel (R)	158	14604	2308747	
Summe			203145	
Knödel jeglicher Art				
Semmelknödel (R)	202	26391	5324469	**211**
Serviettenknödel	239	4979	1188529	
Käsepreßknödel (R)	214	3065	654724	
Tiroler Knödel (R)	215	3033	653494	
Topfengrießknödel (R)	243	2169	526287	
Summe			39638	
Pizzastangerl, Knoblauchbrot				
Pizzastangerl (R)	290	5083	1475811	**301**
Knoblauchbrot (R)	318	3010	957963	
Summe			8094	
Pizza				
Pizza Cardinale (R)	137	38191	5219132	**136**
Pizza salami (R)	158	5203	820287	
Pizza margherita (Tomaten, Mozzarella, Basilikum) (R)	107	4400	471761	
Summe			47795	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Milchprodukte, Fette und Eier				
Butter, Margarine				
Butter	741	110866	82151854	**738**
Margarine	709	9564	6781167	
			120431	
Vollmilch				
Vollmilch 3.6% F (A)	66	65883		**66**
Halbfettmilch				
Kuhmilch teilentrahmt gegart	49			**49**
Magermilch				
Magermilch 0.03% F (A)	35	3223		**35**
Hartkäse				
Käse n. Holl.Art 35% F.i,T,(A)	267	80639	21532997	**288**
Gouda 45% F.i.T. (A)	321	9061	2913022	
Gouda	365	7139	2605881	
Emmentaler 45% F.i.T.(A)	368	5932	2185871	
Bergkäse 45% F.i.T. (A)	330	5305	1748106	
Schafskäse	236	3788	893921	
Schmelzkäse	327	3597	1176219	
gebackener Emmentaler (R)	354	1769	625590	
gebackener Camembert 60% F.i.T. (R)	357	1680	600219	
Summe			118910	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Parmesan				
Parmesan Vollfettstufe	440	5817		**440**
Mozarella				
3525				
Mozarella	255	8027		**255**
Streich- und Frischkäse				
Frischkäse 70% F.i.TR	377	3057	1152666	**351**
Frischkäse	335	2764	925856	
Schmelzkäse streichfähig Doppelrahmstufe	336	2201	739469	
Summe			8022	
Topfen, Sauerrahm				
Liptauer (R)	182	2391	436194	**158**
Danone Topfencreme Vanille	136	2576	351025	
Topfenaufstrich mit Kräutern (R)	156	7250	1133693	
Sauerrahm 15% F (A)	160	1671	267210	
Summe			13887	
Schlagobers				
Schlagobers 36% F (A)	342	8136		**342**
Mayonnaise				
Mayonnaise 80% Fett	743	1679		**743**
Yoghurt, Yoghurtdrinks (3.6%F)				
Joghurt 3.6% F (A)	70	56795	3993612	**76**
Fruchtjoghurt Erdbeere 3.6% (A)	100	15864	1588860	
Actimel Drink Natur	86	2976	254924	
Fruchtjoghurt Aprikose 3.6% (A)	49	2016	99218	
Vanillejoghurt 3.6% (A)	46	1619	74703	
Summe			79270	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Fruchtjoghurt 1% F (A)	78	1721	kann nicht stimmen	
Fettarmes Yoghurt, Buttermilch				
Joghurt entrahmt	38	3605	137000	**37**
Buttermilch	36	1732	62338	
Summe			5337	
Eier				
Hühnerei frisch gegart	149	7922	1180427	**172**
Spiegelei (1 Stk.) (R)	192	5562	1070623	
Rührei (R)	193	2301	444718	
Eieraufstrich (R)	187	1409	263972	
Summe			17194	
Öle, pflanzliche Fette				
Olivenöl	881	5718	5037285	**880**
Kürbiskernöl	879	2224	1954782	
Pflanzliche Fette	878	1932	1695945	
Summe			9873	
Nüsse				
Erdnuß geröstet und gesalzen	568	4544	2580992	**611**
Haselnuß geröstet	658	3000	1974316	
Walnuß europäisch frisch	654	2747	1796407	
Erdnuß frisch	561	2525	1416245	
Haselnuß	636	1654	1051690	
Walnuß frisch	654	2387	1561163	
Nüsse	561	1481	830863	
			18338	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Schweinefleisch				
Schweinefleisch, warme Gerichte				
Wiener Schnitzel vom Schwein gebacken (R)	228	47599	10835484	**210**
Schweinefleisch natur, gebraten (R)	221	39246	8688541	
Schweinsbraten (R)	183	20999	3848336	
Schweinskotelett mit Saft, natur (R)	184	14729	2712921	
Naturschnitzel vom Schwein mit Saft (R)	189	14462	2737048	
Geschnetzeltes Schwein (R)	175	3526	618674	
Cordon bleu (Schwein) (R)	240	2867	687975	
Pariser Schnitzel aus Schwein (R)	214	1581	338835	
Summe			145009	
Schinken				
Schwein Schinken	121	22190	2684960	**121**
Schwein Keule (Schinken) gepökelt ungeräuchert	117	1694	198217	
Summe			23884	
Speck				
Schwein Rückenspeck	697	1603	1117361	**618**
Speckwurst 61% Fett	567	2465	1397355	
Summe			4069	
Geflügel, Putenfleisch und Huhn; nicht gebacken mit Panier				
Pute natur gebraten (R)	229	47361	10834360	**200**
Brathuhn (R)	173	27284	4724465	
Putengeschnetzeltes (R)	188	17704	3331080	
Huhn chinesisch (R)	141	4371	618387	
Paprikahuhn (R)	125	2926	364378	
Geschnetzeltes Geflügel (R)	166	2438	405720	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Putenbrust gebraten, mit Soße (A)	160	1585	253693	
Putenschnitzel natur (R), JA	313	2125	664107	
Summe			105794	
Geflügel, Puten- und Hühnerfleisch gebacken				
Chicken Mc Nuggets (A)	226	2180	492250	**246**
Hühnerschnitzel paniert (R)	228	1527	348701	
Ente gebraten, mit Orangen und Soße (1)	218	1420	309482	
Backhendl (R)	226	9758	2205384	
Putenschnitzel gebacken (R)	267	14734	3932744	
Summe			29618	
Putenschinken				
Putenschinken, mager	126	1837		**126**
Rindfleisch				
Faschierte Laibchen				
Faschierte Laibchen (Rindfleisch) (A)	297	31296		**297**
Rindfleisch gekocht				
Rindfleisch gekocht (R)	131	2056		**131**
Spareribs				
Spareribs (R)	295	1718		**295**
sonstige Rindfleischgerichte				
Rindfleisch gebraten (R)	187	23869	4466690	**171**
Rindsgulasch (R)	135	17313	2337763	
Zwiebelrostbraten (R)	189	3022	572349	
Pfeffersteak mit Soße (R)	220	2335	513848	
Faschierter Braten (R)	183	2316	424659	
Pariser Schnitzel vom Kalb (R)	188	1728	324423	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Summe			50583	
Wurst und gemischte Fleischarten				
Wurst und Leberkäse				
Grillwürstel 25% Fett	286	2046	585409	**296**
Extrawurst rund 25% Fett	265	37623	9956671	
Wurst	355	31964	11347291	
Frankfurter 24% Fett	257	25261	6494917	
Leberkäse 27% Fett	299	25039	7495124	
Bratwurst (R)	314	22285	6992867	
Schinkenwurst	294	12183	3581908	
Käsekrainer 24% Fett	283	11388	3221800	
Schwein Speck roh geräuchert	320	10182	3258368	
Krakauer 6% Fett	142	9534	1356887	
Leberkäse gebraten (2)	284	7043	2000218	
Salami	360	12136	4368816	
Landjäger Würste	456	5882	2682374	
Leberkäse gebacken (R)	291	4066	1183388	
Salami italienische Art	331	3763	1245709	
Knackwurst gebraten (R)	289	3601	1041608	
Kalbsleberwurst	316	3318	1048488	
Berner Würstel (R)	250	3042	761441	
Pariser 11% Fett	184	2807	516621	
Knackwurst 22% Fett	248	2730	677764	
Weißwurst Münchener	270	2700	729000	
Landjäger	456	2348	1070870	
Essigwurst (R)	232	2177	504100	
Pikantwurst 13% Fett	188	1699	319418	
Blutwürste	344	1666	572997	
Burenwurst 31% Fett	323	1613	520265	
Bosna (R)	230	1571	360720	
Summe			249667	
Fleischknödel				
Fleischknödel (R)	166	5727	951123	**164**
Leberknödel (R)	183	3131	573254	
Grammelknödel (R)	119	1589	189159	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Summe			10446	
Kebab				
Döner Kebap im Sandwich (R)	228	16083		**228**
Hamburger				
Hamburger (R)	181			**181**
offene Frage: sonstige Fleischgerichte				
Rehragout (3)	199	5840	1162064	**203**
Lamm- und Hammelbraten (R)	228	2871	655825	
Rindsrouladen mit Speck (R)	119	2598	308561	
Leberpastete	299	1749	522996	
Summe			13058	
Fisch				
Gebraten, Salat				
Fischfilet gebraten (R)	105	12953	1357883	**101**
Lachs gebraten (R)	106	1860	197582	
Endiviensalat (R)	79	1402	110642	
Thunfischsalat mit Zwiebeln, Salat, Paprika (R)	76	1799	137271	
Heringssalat (R)	116	1395	161200	
Summe			19409	
Gebacken				
Fischfilet paniert, gebacken (R)	170	9530	1624887	**170**
Zander gebacken (R)	170	1652	281331	
			11182	
Thunfisch				
Thunfisch Konserve abgetropft	219	5048		**219**

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Süßspeisen				
Schokolade				
Milchschokolade	536	63001	33768482	**535**
Milchschokolade Vollmilch-Nuß	521	6560	3417859	
			69561	
Bitterschokolade				
Bitterschokolade	394	2135		**394**
Schokoladeriegel				
Manner Cremewaffeln 250g	465	21733	10095458	**481**
Kekse - Hartkekse	480	15504	7441920	
Balisto Korn-Mix	515	2806	1444335	
Mars	460	5785	2660716	
Manner Neapolitaner Schnitten	468	3565	1667932	
Twix	492	2048	1007882	
Snickers	509	1828	930407	
Bounty hell	470	1459	685743	
Kekse mit Schokoladeüberzug 9 Stück (R)	518	8573	4436792	
Balisto Joghurt-Beeren-Mix	515	2298	1184168	
Summe			65598	
Rumkugeln				
Rumkugeln	403	2015		**403**
Powerbar und Müsliriegel				

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Powerbar Performance Original Energieriegel (A)	342	3112	1064372	**354**
Müsli-Riegel	375	1894	710156	
Summe			5006	
Kekse, Butterkekse, Lebkuchen				
Vanillekipferl aus Rührmasse	491	4322	2121891	**471**
Butterkeks	480	2158	1035840	
Lebkuchenteigbackwaren	412	1792	738386	
			8272	
Kokosbusserl				
Kokosbusserl	576	2308		**576**
Kipferl, Topfentascherl, Zimtschnecke, Krapfen				
Kipferl aus Wien aus Hefeteig fettreich	413	1569	648162	**334**
Kipferl aus Hefeteig fettarm	307	9014	2767151	
Faschingskrapfen	391	14268	5575319	
Hefezopf aus Hefeteig fettarm	302	3684	1112689	
Topfentascherl mit Semmelbrösel (R)	283	2934	831713	
Zimtschnecke (R)	319	2739	872621	
Topfenkolatschen	309	2253	695541	
Butterkipferl aus Hefeteig fettarm	301	1610	484715	
Buchteln (R)	220	2474	543524	
Summe			40546	
Kipferl aus Blätterteig, Croissant				
Kipferl aus Blätterteig	470	6674	3136780	**483**
Croissant aus Blätterteig	508	3607	1832254	
Summe			10281	
Croissant mit Schokoladefüllung				
Croissant mit Schokofüllung	815	1466		**815**

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Kuchen (kein Obstkuchen)				
Gugelhupf (R)	342	52067	17807927	**341**
Marillenkuchen	300	7629	2291358	
Marmorgugelhupf	364	12860	4686139	
Kuchen	376	7332	2756832	
Kuchen aus Rührmasse mit Schokolade u. Schlag (R)	367	7296	2680813	
Mohnkuchen (R)	381	1696	646561	
Nusskuchen (R)	255	1925	490970	
Biskuitroulade mit Marmelade (R)	243	3904	950147	
Summe			94710	
Obstkuchen				
Apfelkuchen aus Mürbeteig (R)	117	3961	462870	**157**
Zwetschkenkuchen (R)	170	3088	526371	
Kirschkuchen (R)	257	1622	417653	
Kuchen mit Beerenobst (R)	168	2158	361650	
Marillenknödel, Kartoffelteig (R)	123	1844	226511	
Summe			12673	
Torten und süße Schnitten				
Bananenschnitte(R)	280	3628	1017095	**331**
Schwarzwälder Kirschtorte	314	2227	699288	
Linzertorte	417	4437	1850296	
Torte "Malakow" nur aus Biskotten bestehend (R)	375	5523	2070585	
Torten	247	1408	347751	
Torte mit Nüssen und Schokoglasur (R)	357	4093	1459238	
Topfentorte (R)	244	4546	1108749	
Summe			25862	
Schaumrollen				
Schaumrollen (1 Stk.) (R)	497	2287		**497**
Palatschinken und Kaiserschmarren				

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Topfenpalatschinken (R) überbacken neu	208	1632	339265	**197**
Palatschinken mit Marillenmarmelade (1.Stk.) (R)	219	7124	1560630	
Palatschinken (R)	189	6223	1174630	
Striezel (Germteig) (R)	189	4237	799310	
Kaiserschmarren (R)	178	4110	732988	
Summe			23326	
Strudel				
Topfenstrudel (R)	181	10454	1888093	**204**
Apfelstrudel	165	22050	3638189	
Nußstrudel (Germteig) (R)	266	6604	1757169	
Mohnstrudel	361	4292	1549395	
Summe			43399	
Tiramisu				
Tiramisu (R)	269	4598		**269**
Waffeln				
Sahnewaffel	554	1634		**554**
Zucker				
Zucker weiß	405	21513		**405**
Honig				
Honig	306	16555		**306**
Nutella				
Nutella Brotaufstrich	514	8221		**514**
Marmelade				

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Marmelade Erdbeere 70:30 (A)	153	6586	1005822	**220**
Marmelade Preiselbeere 1:1 (A)	368	2134	784858	
Marmelade Aprikose/Marille 1:1 (A)	232	11509	2666951	
Summe			20229	
Eis				
Eisdessert Vanille	94	3152	296061	**118**
Eisdessert Erdbeer	109	2863	311705	
Eiscreme	160	2664	426240	
Pudding Vanille (R)	115	2345	268965	
Vanilleeis mit heißen Himbeeren (6)	114	2077	236826	
Summe			13102	
Getränke				
Alkoholische Getränke				
Bier	42	75879	3186931	**42**
Most	43	2184	93929	
Summe			78064	
Bier mit Limonade				
Bier mit Limonade	34	1839		**34**
Wein				
Weißwein / Rotwein	74	21423	1585275	**72**
Rotwein leicht	66	8529	562882	
Rotwein mittel Qualitätswein	66	3704	244481	
Weißwein halbtrocken	74	3260	241218	
Schaumwein	79	1758	138862	
Weißwein trocken	72	1688	121565	
Weintraube rot Fruchtsaft	70	3430	240100	
Summe			43791	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Antialkoholische Getränke				
Säfte				
YO Multivitaminsaft	49	3183	157074	**48**
Apfel Fruchtsaft	49	51884	2542311	
Orange Fruchtsaft	45	43559	1960160	
Pago Multivitaminsaft gold	48	13163	635386	
Pfanner ACE Mehrfruchtsaft-Getränk - Guten Morgen -	31	1786	55454	
Fruchtsaftgetränke	47	5769	271155	
Orange Fruchtnektar	63	5623	354233	
Pfanner Multivitamin Nektar	44	2866	127380	
Ananas Fruchtsaft	59	2431	143417	
Summe			130265	
Zitrone, Johannisbeere				
Zitrone Fruchtsaft	100	2334	233400	**101**
Johannisbeere rot Fruchtsaft	102	6069	619038	
			8403	
Sirup				
Sirup	322	62220		**322**
Latella				
Latella Frucht diverse	20	1471		**20**
Cola				
Colagetränke (coffeinhaltig)	61	28182		**61**
Limonaden, Red Bull				
Limonaden	42	15660	657707	**43**
Red Bull Energy Drink	47	2622	122726	

Lebensmittel/gruppenbildung aus Food List	Energie-gehalt (kcal/ 100g) aus BLS	Verzehrs-häufigkeit des Lebens-mittels (g) (Elmadfa et al., 2009a)	Energie-gehalt * Verzehrs-häufigkeit	Energie-gehalt-mittelwert gewichtet nach der Verzehrs-häufigkeit (kcal/ 100g
Limonaden mit Fruchtgeschmack	42	2281	95785	
Limonaden mit Kohlensäure	42	1407	59094	
Summe			21969	
Kaffee				
Kaffee (Getränk)	2	12593		**2**
Milchkaffee ohne Zucker (R)	45			**45**
Pfanner Tea				
Pfanner Tea & Juice	34	11545		**34**
Kakao				
Milcherzeugnis mit Kakao/Schokolade	131	8606		**6150**
Wasser				
Römerquelle Emotion (A)	17	3708		**17**

Calculation of portion size and data source from food items and food groups (in g)

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
2.1.1.B Obst außer Bananen			**0,54**	
☐ < ½ Portion	31		0,54	16,80
☐ ½ Portion	63		0,54	33,61
☐ 1 Portionen	125	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	0,54	67,21
☐ 2 Portionen	250		0,54	134,42
☐ 3 Portionen	375		0,54	201,64
☐ > 3 Portionen	500		0,54	268,85
2.2.2.B. Bananen			**0,95**	
☐ < ½ Banane	41		0,95	38,59
☐ ½ Banane	81		0,95	77,19
☐ 1 Banane	163	selbst abgewogen	0,95	154,38
☐ 2 Bananen	325		0,95	308,56
☐ 3 Bananen	488		0,95	463,13
☐ > 3 Bananen	650		0,95	617,50
2.3.1.B. rohes und/oder gedünstetes Gemüse			**0,38**	
☐ < ½ Portion	25		0,38	9,55
☐ ½ Portion	50		0,38	19,11
☐ 1 Portionen	100	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	0,38	38,22
☐ 2 Portionen	200		0,38	76,43
☐ 3 Portionen	300		0,38	114,65
☐ > 3 Portionen	400		0,38	152,86
2.3.2.B. Gemüse als Cremesuppen, Saucen und/oder warmes Gerichte			**0,97**	
☐ < ½ Portion	50		0,97	48,71
☐ ½ Portion	100		0,97	97,41

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ 1 Portionen	200	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	0,97	194,82
☐ 2 Portionen	400		0,97	389,65
☐ 3 Portionen	600		0,97	584,47
☐ > 3 Portionen	800		0,97	779,29
2.3.3.B. Häuptelsalat			**0,96**	
☐ < 1 Portion	25		0,96	24,01
☐ 1 Portionen	50		0,96	48,03
☐ 2 Portionen	100	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	0,96	96,05
☐ 3 Portionen	150		0,96	144,08
☐ 4 Portionen	200		0,96	192,11
☐ > 5 Portionen	250		0,96	240,14
2.3.4.B. Kartoffel gegart, geröstet, und/oder als Knödel oder Püree			**0,91**	
☐ <1/2 Portion	25		0,91	22,79
☐ 1/2 Portionen	50		0,91	45,57
☐ 1 Portionen	100	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	0,91	91,14
☐ 2 Portionen	200		0,91	182,29
☐ 3 Portionen	300		0,91	273,43
☐ > 3 Portionen	400		0,91	364,57
2.3.5.B. Kartoffeln als Puffer, Auflauf, Kroketten und/oder Pommes			**1,64**	
☐ <1/2 Portion	38		1,64	61,36
☐ 1/2 Portionen	75		1,64	122,71
☐ 1 Portionen	150	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,64	245,42
☐ 2 Portionen	300		1,64	490,85
☐ 3 Portionen	450		1,64	736,27
☐ > 3 Portionen	600		1,64	981,70

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
2.3.6.B. Chips, Erdnussflips und/oder Popcorn			**5,26**	
☐ <1 Portion	13		5,26	65,78
☐ 1 Portionen	25	Kartoffelchips (verzehrsfertig) = 25g/portion; Funny and Frisch Kelly's chip gesalzen = 25g/portion	5,26	131,56
☐ 2 Portionen	50		5,26	263,12
☐ 3 Portionen	75		5,26	394,68
☐ 4 Portionen	100		5,26	526,24
☐ > 4 Portionen	125		5,26	657,81
			2,10	
3.1.1.B. Roggen- und Vollkornbrot			2,10	0,00
☐ < 1/2 Portion	13		2,10	26,20
☐ 1/2 Portion	25		2,10	52,41
☐ 1 Portion	50	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,10	104,81
☐ 2 Portionen	100		2,10	209,63
☐ 3 Portionen	150		2,10	314,44
☐ > 3 Portionen	200		2,10	419,26
3.1.2.B. Weißbrot, Semmeln und Toast			**2,47**	
☐ < 1/2 Portion	11		2,47	27,83
☐ 1/2 Portion	23		2,47	55,66
☐ 1 Portion	45	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,47	111,32
☐ 2 Portionen	90		2,47	222,63
☐ 3 Portionen	135		2,47	333,95
☐ > 3 Portionen	180		2,47	445,26

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
3.1.3.B. Salzstangerl, Laugengebäck, Knäckebrot und/oder Knabbergebäck			**3,31**	
☐ < 1/2 Portion	14		3,31	45,46
☐ 1/2 Portion	28		3,31	90,91
☐ 1 Portion	55	Anker	3,31	181,83
☐ 2 Portionen	110		3,31	363,65
☐ 3 Portionen	165		3,31	545,48
☐ > 3 Portionen	220		3,31	727,31
3.2.1.B. Reis, Milchreis und/oder Risotto gekocht			**1,20**	
☐ < 1/2 Portion	25		1,20	30,07
☐ 1/2 Portion	50		1,20	60,13
☐ 1 Portion	100	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,20	120,27
☐ 2 Portionen	200		1,20	240,53
☐ 3 Portionen	300		1,20	360,80
☐ > 3 Portionen	400		1,20	481,07
3.3.1.B. Müsli, Haferflocken und/ oder Cornflakes			**3,54**	
☐ < 1/2 Portion	11		3,54	39,79
☐ 1/2 Portion	23		3,54	79,58
☐ 1 Portion	45	Verpackungs angabe/ Kellogs	3,54	159,16
☐ 2 Portionen	90		3,54	318,31
☐ 3 Portionen	135		3,54	477,47
☐ > 3 Portionen	180		3,54	636,63
3.4.1.B. Nudel, Eierteigwaren, Nockerl und/ oder Spätzle			**1,42**	
☐ < 1/2 Portion	25		1,42	35,44
☐ 1/2 Portion	50		1,42	70,89
☐ 1 Portion	100	Mengenlehre[UNION DEUTSCHE	1,42	141,78

		LEBENSMITTEL WERKE, 1997]		
Lebensmittel/gruppe (Antwortmöglichkeit)	**Portions-größe (g)**	**Datenquelle**	**Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)**	**kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)**
☐ 2 Portionen	200		1,42	283,56
☐ 3 Portionen	300		1,42	425,34
☐ > 3 Portionen	400		1,42	567,12
3.5.1.B. Knödel			**2,11**	
☐ < 1/2 Portion	50		2,11	105,30
☐ 1/2 Portion	100		2,11	210,60
☐ 1 Portion	200	BLS	2,11	421,19
☐ 2 Portionen	400		2,11	842,38
☐ 3 Portionen	600		2,11	1263,57
☐ > 3 Portionen	800		2,11	1684,76
3.6.1.B. Pizzastangerl und/oder Knoblauchbrot			**3,01**	
☐ < 1/2 Portion	34		3,01	100,73
☐ 1/2 Portion	67		3,01	201,47
☐ 1 Portion	134	BLS	3,01	402,93
☐ 2 Portionen	268		3,01	805,86
☐ 3 Portionen	402		3,01	1208,80
☐ > 3 Portionen	536		3,01	1611,73
3.6.2.B. Pizza			**1,36**	
☐ < 1/2 Portion	88		1,36	119,20
☐ 1/2 Portion	175		1,36	238,40
☐ 1 Portion	350	tiefkühlpizza Dr. Ötker, Ristorante	1,36	476,81
☐ 2 Portionen	700		1,36	953,62
☐ 3 Portionen	1050		1,36	1430,43
☐ > 3 Portionen	1400		1,36	1907,24
4.1.1.B. Butter und/oder Margarine			**7,38**	
☐ < ½ TL	1		7,38	7,38
☐ 1/2 TL	2		7,38	14,77
☐ 1 TL	4	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	7,38	29,54
☐ 2 TL	8		7,38	59,08
☐ 3 TL	12		7,38	88,62
☐ > 3 TL	16		7,38	118,15

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
4.2.1.B. Milch				
☐ < 1/2 Portion	50		1,00	50,00
☐ 1/2 Portion	100		1,00	100,00
☐ 1 Portion	200	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,00	200,00
☐ 2 Portionen	400		1,00	400,00
☐ 3 Portionen	600		1,00	600,00
☐ > 3 Portionen	800		1,00	800,00
4.2.1.C.Milch				
☐ vollmilch 3.6%				0,66
☐ Milch Halbfett				0,49
☐ Magermilch 0,03%				0,35
4.3.1.B. Hartkäse			**2,88**	
☐ < 1/2 Scheibe	8		2,88	21,62
☐ 1/2 Scheibe	15		2,88	43,25
☐ 1 Scheibe	30	Mengenlehre[UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,88	86,49
☐ 2 Scheibe	60		2,88	172,98
☐ 3 Scheiben	90		2,88	259,47
☐ > 3 Scheiben Käse	120		2,88	345,96
4.3.2.B. Parmesan			**4,40**	
☐ < 1/2 Esslöffel	1		4,40	5,50
☐ 1/2 Esslöffel	3		4,40	11,00
☐ 1 Esslöffel	5	Abgewogen	4,40	22,00
☐ 2 Esslöffel	10		4,40	44,00
☐ 3 Esslöffel	15		4,40	66,00
☐ > 3 Esslöffel	20		4,40	88,00
4.3.3.B. Mozarella			**2,55**	
☐ < 1/4 Portion	16		2,55	39,84
☐ 1/4 Portion	31		2,55	79,69
☐ 1/2 Portion	63		2,55	159,38
☐ 1 Portion	125	Verpackungs angabe	2,55	318,75
☐ 2 Portionen	250		2,55	637,50
☐ > 2 Portionen	375		2,55	956,25

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
4.3.4.B. Streich- und Frischkäse			**3,51**	
☐ < 1/2 Esslöffel	5		3,51	17,56
☐ 1/2 Esslöffel	10		3,51	35,13
☐ 1 Esslöffel	20	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	3,51	70,26
☐ 2 Esslöffel	40		3,51	140,51
☐ 3 Esslöffel	60		3,51	210,77
☐ > 3 Esslöffel	80		3,51	281,03
4.4.1.B. Topfen, Liptauer und/oder Sauerrahm			**1,58**	
☐ < 1/2 Esslöffel	5		1,58	7,88
☐ 1/2 Esslöffel	10		1,58	15,76
☐ 1 Esslöffel	20	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,58	31,51
☐ 2 Esslöffel	40		1,58	63,02
☐ 3 Esslöffel	60		1,58	94,54
☐ > 3 Esslöffel	80		1,58	126,05
4.4.2.B. Schlagobers			**3,42**	
☐ < 1/2 Esslöffel	4		3,42	12,82
☐ 1/2 Esslöffel	8		3,42	25,63
☐ 1 Esslöffel	15	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	3,42	51,26
☐ 2 Esslöffel	30		3,42	102,53
☐ 3 Esslöffel	45		3,42	153,79
☐ > 3 Esslöffel	60		3,42	205,06
4.4.3.B. Mayonnaise			**7,43**	
☐ < 1/2 Esslöffel	3		7,43	22,29
☐ 1/2 Esslöffel	6		7,43	44,58
☐ 1 Esslöffel	12	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	7,43	89,16
☐ 2 Esslöffel	24		7,43	178,32

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ 3 Esslöffel	36		7,43	267,48
☐ > 3 Esslöffel	48		7,43	356,64
4.5.1.B. Yoghurt (vollfett)			**0,76**	
☐ < 1/2 Portion	50		0,76	37,92
☐ 1/2 Portion	100		0,76	75,83
☐ 1 Portion	200	Verpackungs angabe	0,76	151,67
☐ 2 Portionen	400		0,76	303,33
☐ 3 Portionen	600		0,76	455,00
☐ > 3 Portionen	800		0,76	606,66
4.5.2.B. fettarme Joghurtprodukte und/oder Buttermilch			**0,37**	
☐ < 1/2 Portion	50		0,37	18,68
☐ 1/2 Portion	100		0,37	37,35
☐ 1 Portion	200	Verpackungs angabe	0,37	74,70
☐ 2 Portionen	400		0,37	149,40
☐ 3 Portionen	600		0,37	224,11
☐ > 3 Portionen	800		0,37	298,81
4.6.1.B. Ei			**1,72**	
☐ < 1/2 Ei	15		1,72	25,82
☐ 1/2 Ei	30		1,72	51,64
☐ 1 Ei	60	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,72	103,28
☐ 2 Eier	120		1,72	206,56
☐ 3 Eier	180		1,72	309,84
☐ > 3 Eier	240		1,72	413,12
4.7.1.B. pflanzliche Fette			**8,80**	
☐ < 1/2 Esslöffel	3		8,80	22,00
☐ 1/2 Esslöffel	5		8,80	44,00
☐ 1 Esslöffel	10	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	8,80	88,00
☐ 2 Esslöffel	20		8,80	175,99
☐ 3 Esslöffel	30		8,80	263,99
☐ > 3 Esslöffel	40		8,80	351,99

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
4.8.1.B. Nüsse			**6,11**	
☐ < 1/2 Esslöffel	2		6,11	12,23
☐ 1/2 Esslöffel	4		6,11	24,46
☐ 1 Esslöffel	8	abgewogen/ Haselnuss	6,11	48,91
☐ 2 Esslöffel	16		6,11	97,83
☐ 3 Esslöffel	24		6,11	146,74
☐ > 3 Esslöffel	32		6,11	195,65
5.1.1.B. Schweinefleischgerichte			**2,10**	
☐ < 1/2 Portion	31		2,10	65,66
☐ 1/2 Portion	63		2,10	131,32
☐ 1 Portion	125	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,10	262,64
☐ 2 Portionen	250		2,10	525,27
☐ 3 Portionen	375		2,10	787,91
☐ > 3 Portionen	500		2,10	1050,55
5.1.2.B. Schweineschinken			**1,21**	
☐ < 1/2 Scheibe	5		1,21	6,04
☐ 1/2 Scheibe	10		1,21	12,07
☐ 1 Scheibe	20	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,21	24,14
☐ 2 Scheiben	40		1,21	48,29
☐ 3 Scheiben	60		1,21	72,43
☐ > 3 Scheiben	80		1,21	96,57
5.1.3.B. Speck			**6,18**	
☐ < 1/2 Scheibe	9		6,18	54,08
☐ 1/2 Scheibe	18		6,18	108,16
☐ 1 Scheibe	35	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	6,18	216,33
☐ 2 Scheiben	70		6,18	432,66
☐ 3 Scheiben	105		6,18	648,99
☐ > 3 Scheiben	140		6,18	865,32

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
5.2.1.B. Geflügel, Puten- und Hühnerfleisch			**2,00**	
☐ < 1/2 Portion	25		2,00	50,09
☐ 1/2 Portion	50		2,00	100,18
☐ 1 Portion	100	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,00	200,35
☐ 2 Portionen	200		2,00	400,71
☐ 3 Portionen	300		2,00	601,06
☐ > 3 Portionen	400		2,00	801,42
5.2.2.B. Geflügel, Puten- und Hühnerfleisch gebacken			**2,46**	
☐ < 1/2 Portion	25		2,46	61,52
☐ 1/2 Portion	50		2,46	123,04
☐ 1 Portion	100	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,46	246,08
☐ 2 Portionen	200		2,46	492,17
☐ 3 Portionen	300		2,46	738,25
☐ > 3 Portionen	400		2,46	984,33
5.2.3.B. Putenschinken			**1,26**	
☐ < 1/2 Scheibe	5		1,26	6,30
☐ 1/2 Scheibe	10		1,26	12,60
☐ 1 Scheibe	20	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,26	25,20
☐ 2 Scheiben	40		1,26	50,40
☐ 3 Scheiben	60		1,26	75,60
☐ > 3 Scheiben	80		1,26	100,80
5.3.1.B. faschierte Laibchen			**2,97**	
☐ < 1/2 Portion	31		2,97	92,81
☐ 1/2 Portion	63		2,97	185,63
☐ 1 Portion	125	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,97	371,25

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ 2 Portionen	250		2,97	742,51
☐ 3 Portionen	375		2,97	1113,76
☐ > 3 Portionen	500		2,97	1485,02
5.3.2.B. Rindfleisch gekocht			**1,31**	
☐ < 1/2 Portion	31		1,31	41,00
☐ 1/2 Portion	63		1,31	82,01
☐ 1 Portion	125	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,31	164,01
☐ 2 Portionen	250		1,31	328,03
☐ 3 Portionen	375		1,31	492,04
☐ > 3 Portionen	500		1,31	656,05
5.3.3.B. Spareribs			**2,95**	
☐ < 1/2 Portion	45		2,95	132,62
☐ 1/2 Portion	90		2,95	265,24
☐ 1 Portion	180	BLS	2,95	530,48
☐ 2 Portionen	360		2,95	1060,96
☐ 3 Portionen	540		2,95	1591,44
☐ > 3 Portionen	184		2,95	542,27
5.3.4.B. Rindfleischgerichte wie Zwiebelrostbraten, Steak, Schnitzel und sonstige gebratene oder gebackene Speisen			**1,71**	
☐ < 1/2 Portion	31		1,71	53,38
☐ 1/2 Portion	63		1,71	106,75
☐ 1 Portion	125	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,71	213,51
☐ 2 Portionen	250		1,71	427,01
☐ 3 Portionen	375		1,71	640,52
☐ > 3 Portionen	500		1,71	854,02
5.4.1.B. Wurst und/oder Leberkäse			**2,96**	
☐ < 1/2 Portion	38		2,96	110,99

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ 1/2 Portion	75		2,96	221,98
☐ 1 Portion	150	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	2,96	443,96
☐ 2 Portionen	300		2,96	887,92
☐ 3 Portionen	450		2,96	1331,88
☐ > 3 Portionen	600		2,96	1775,85
5.4.2.B. Fleischknödel			**1,64**	
☐ < 1/2 Portion	25		1,64	41,01
☐ 1/2 Portion	50		1,64	82,02
☐ 1 Portion	100	Fleischknödel von Iglo	1,64	164,03
☐ 2 Portionen	200		1,64	328,07
☐ 3 Portionen	300		1,64	492,10
☐ > 3 Portionen	400		1,64	656,13
5.4.3.B. Kebap			**2,28**	
☐ < 1/2 Portion	91		2,28	207,72
☐ 1/2 Portion	183		2,28	415,45
☐ 1 Portion	365	selbst abgewogen, Thaliastraße Kebapstand	2,28	830,89
☐ 2 Portionen	730		2,28	1661,78
☐ 3 Portionen	1095		2,28	2492,67
☐ > 3 Portionen	1460		2,28	3323,56
5.4.4.B. Burger			1,81	
☐ < 1/2 Portion	27		1,81	48,08
☐ 1/2 Portion	53		1,81	96,16
☐ 1 Portion	106	von McDonalds	1,81	192,31
☐ 2 Portionen	212		1,81	384,63
☐ 3 Portionen	318		1,81	576,94
☐ > 3 Portionen	424		1,81	769,25
5.5.1.B. Fisch gebraten und/oder als Salat			**1,01**	
☐ < 1/2 Portion	38		1,01	37,96
☐ 1/2 Portion	75		1,01	75,91
☐ 1 Portion	150	Mengenlehre [UNION	1,01	151,83

		DEUTSCHE LEBENSMITTEL WERKE, 1997]		
Lebensmittel/gruppe (Antwortmöglichkeit)	**Portions-größe (g)**	**Datenquelle**	**Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)**	**kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)**
☐ 2 Portionen	300		1,01	303,66
☐ 3 Portionen	450		1,01	455,48
☐ > 3 Portionen	600		1,01	607,31
5.5.2.B. Fisch gebacken			**1,70**	
☐ < 1/2 Portion	38		1,70	63,93
☐ 1/2 Portion	75		1,70	127,85
☐ 1 Portion	150	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,70	255,70
☐ 2 Portionen	300		1,70	511,40
☐ 3 Portionen	450		1,70	767,10
☐ > 3 Portionen	600		1,70	1022,80
5.5.3.B. Thunfisch			**2,19**	
☐ < 1/2 Portion	38		2,19	82,13
☐ 1/2 Portion	75		2,19	164,25
☐ 1 Portion	150	Konservenge wicht	2,19	328,50
☐ 2 Portionen	300		2,19	657,00
☐ 3 Portionen	450		2,19	985,50
☐ > 3 Portionen	600		2,19	1314,00
6.1.1.B. Milchschokolade und/oder gefüllte Schokolade			**5,35**	
☐ < als ¼ Tafel	13		5,35	66,82
☐ ¼ bis ½ Tafel	25		5,35	133,65
☐ ½ bis 1 Tafel	75		5,35	400,94
☐ 1 Tafel	100	Verpackungs angabe	5,35	534,59
☐ 2 Tafeln	200		5,35	1069,17
☐ > als 2 Tafeln	300		5,35	1603,76
6.1.2.B. Bitterschokolade			**3,94**	
☐ < 1/2 Portion	13		3,94	49,25
☐ 1/2 Portion	25		3,94	98,50
☐ 1 Portion	75		3,94	295,50
☐ 2 Portionen	100		3,94	394,00
☐ 3 Portionen	200		3,94	788,00

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ > 3 Portionen	300		3,94	1182,00
6.1.3.B. Twix, Mars, Bounty, Balisto, Snickers, Mannerschnitten etc., sowie Schokokekse			**4,81**	
☐ < 1/2 Portion	12		4,81	58,21
☐ 1/2 Portion	24	Twix = 58g/portion; Mars=50g/portion; Manner Original Napolitane Schnitte = 40g/portion	4,81	116,41
☐ 1 Portion	48	48,40	4,81	232,82
☐ 2 Portionen	97		4,81	465,65
☐ 3 Portionen	145		4,81	698,47
☐ > 3 Portionen	194		4,81	931,29
6.1.4.B. Rumkugeln			**4,03**	
☐ < 2 Rumkugeln	6		4,03	24,18
☐ 2-5 Rumkugeln	15		4,03	60,45
☐ 5 Rumkugeln	30	1 Rumkugel wiegt 6g (selbst abgewogen)	4,03	120,90
☐ 5-10 Rumkugeln	45		4,03	181,35
☐ 10-15 Rumkugeln	75		4,03	302,25
☐ > 15 Rumkugeln	120		4,03	483,60
6.2.1.B. Powerbars und/oder Müsliriegel			**3,54**	
☐ < 1/2 Portion	8		3,54	26,59
☐ 1/2 Portion	15		3,54	53,17
☐ 1 Portion	30	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	3,54	106,35
☐ 2 Portionen	60		3,54	212,69
☐ 3 Portionen	90		3,54	319,04
☐ > 3 Portionen	120		3,54	425,38
6.3.1.B. Kekse			**4,71**	

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ < 2 Kekse	6	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	4,71	28,26
☐ 2-5 Kekse	21		4,71	98,91
☐ 5 Kekse	30		4,71	141,30
☐ 5-10 Kekse	45		4,71	211,96
☐ 10-15 Kekse	75		4,71	353,26
☐ > 15 Kekse	120		4,71	565,22
6.3.2.B. Kokosbusserl			**5,76**	
☐ < 2 Kokosbusserl	25		5,76	143,95
☐ 2-5 Kokosbusserl	63		5,76	359,86
☐ 5 Kokosbusserl	125	BLS Keks aus Baisermasse	5,76	719,73
☐ 5-10 Kokosbusserl	188		5,76	1079,59
☐ 10-15 Kokosbusserl	313		5,76	1799,32
☐ > 15 Kokosbusserl	500		5,76	2878,91
6.4.1.B. Kipferl, Topfentascherl, Zimtschnecke, Krapfen und/oder Buchteln			**3,34**	
☐ < 1/2 Portion	21		3,34	70,08
☐ 1/2 Portion	42		3,34	140,17
☐ 1 Portion	84	Mittelwert aus mürbem Kipferl, halber Zimtschnecke, Krapfen und Topfenkolatsche von Anker	3,34	281,58
☐ 2 Portionen	168		3,34	560,67
☐ 3 Portionen	252		3,34	841,00
☐ > 3 Portionen	336		3,34	1121,33
6.4.2.B. Kipferl aus Blätterteig			**4,83**	
☐ < ½ Kipferl	15		4,83	72,50

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ ½ Kipferl	30		4,83	145,00
☐ 1 Kipferl	60	Croissant von Anker	4,83	290,00
☐ 2 Kipferl	120		4,83	580,00
☐ 3 Kipferl	180		4,83	870,00
☐ > 3 Kipferl	240		4,83	1160,00
6.4.3.B. Croissant gefüllt mit Schokolade			**8,15**	
☐ < ½ Croissant	20		8,15	162,92
☐ ½ Croissant	40		8,15	325,83
☐ 1 Croissant	80	Croissant von Anker	8,15	651,66
☐ 2 Croissant	160		8,15	1303,33
☐ 3 Croissant	240		8,15	1954,99
☐ > 3 Croissant	320		8,15	2606,65
6.4.4.B. Kuchen			**3,41**	
☐ < ½ Stück	14		3,41	46,91
☐ ½ Stück	28		3,41	93,82
☐ 1 Stück	55	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	3,41	187,63
☐ 2 Stück	110		3,41	375,27
☐ 3 Stück	165		3,41	562,90
☐ > 3 Stück	220		3,41	750,54
6.4.5.B. Obstkuchen (außer Marillenkuchen) und/oder Obstknödel			**1,57**	
☐ < ½ Stück	14		1,57	21,65
☐ ½ Stück	28		1,57	43,29
☐ 1 Stück	55	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	1,57	86,58
☐ 2 Stück	110		1,57	173,17
☐ 3 Stück	165		1,57	259,75
☐ > 3 Stück	220		1,57	346,33
6.4.6.B. Torten und/oder süße Schnitten			**3,31**	
☐ < ½ Stück	25		3,31	82,68

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ ½ Stück	50		3,31	165,36
☐ 1 Stück	100	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	3,31	330,72
☐ 2 Stück	150		3,31	496,07
☐ 3 Stück	200		3,31	661,43
☐ > 3 Stück	250		3,31	826,79
6.4.7.B. Schaumrollen			**4,97**	
☐ < ½ Schaumrolle	27		4,97	134,26
☐ ½ Schaumrolle	54		4,97	268,51
☐ 1 Schaumrolle	108	BLS	4,97	537,02
☐ 2 Schaumrollen	216		4,97	1074,04
☐ 3 Schaumrollen	324		4,97	1611,06
☐ > 3 Schaumrollen	432		4,97	2148,08
6.4.8.B. Palatschinken und/oder Kaiserschmarren			**1,97**	
☐ < ½ Palatschinke	25		1,97	49,37
☐ ½ Palatschinke	50		1,97	98,75
☐ 1 Palatschinke	100	BLS	1,97	197,50
☐ 2 Palatschinken	200		1,97	394,99
☐ 3 Palatschinken	300		1,97	592,49
☐ > 3 Palatschinken	400		1,97	789,99
6.4.9.B. Strudel			**2,04**	
☐ < ½ Stück	38		2,04	76,32
☐ ½ Stück	75		2,04	152,64
☐ 1 Stück	150	Apfelstrudel von Der Mann	2,04	305,29
☐ 2 Stück	300		2,04	610,58
☐ 3 Stück	450		2,04	915,87
☐ > 3 Stück	600		2,04	1221,16
6.4.10.B. Tiramisu			**2,69**	
☐ < ½ Stück	23		2,69	60,41
☐ ½ Stück	45		2,69	120,83
☐ 1 Stück	90	von Bontá Divina	2,69	241,65
☐ 2 Stück	180		2,69	483,31
☐ 3 Stück	270		2,69	724,96

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ > 3 Stück	360		2,69	966,61
6.4.11.B. Waffeln			**5,54**	
☐ < ½ Waffel	13		5,54	69,25
☐ ½ Waffel	25		5,54	138,50
☐ 1 Waffel	50	BLS	5,54	277,00
☐ 2 Waffeln	100		5,54	554,00
☐ 3 Waffeln	150		5,54	831,00
☐ > 3 Waffeln	200		5,54	1108,00
6.5.1.B. Zucker			**4,05**	
☐ < 1/2 Esslöffel	4		4,05	15,19
☐ 1/2 Esslöffel	8		4,05	30,38
☐ 1 Esslöffel	15	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	4,05	60,75
☐ 2 Esslöffel	30		4,05	121,50
☐ 3 Esslöffel	45		4,05	182,25
☐ > 3 Esslöffel	60		4,05	243,00
6.5.2.B. Honig			**3,06**	
☐ < 1/2 Esslöffel	5		3,06	15,30
☐ 1/2 Esslöffel	10		3,06	30,60
☐ 1 Esslöffel	20	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	3,06	61,20
☐ 2 Esslöffel	40		3,06	122,40
☐ 3 Esslöffel	60		3,06	183,60
☐ > 3 Esslöffel	80		3,06	244,80
6.5.3.B. Nutella			**5,14**	
☐ < 1/2 Esslöffel	5		5,14	25,68
☐ 1/2 Esslöffel	10		5,14	51,36
☐ 1 Esslöffel	20	BLS	5,14	102,73
☐ 2 Esslöffel	40		5,14	205,45
☐ 3 Esslöffel	60		5,14	308,18
☐ > 3 Esslöffel	80		5,14	410,91
6.5.4.B. Marmelade			**2,20**	
☐ < 1/2 Esslöffel	5		2,20	11,02
☐ 1/2 Esslöffel	10		2,20	22,04
☐ 1 Esslöffel	20	Mengenlehre [UNION	2,20	44,07

		DEUTSCHE LEBENSMITTEL WERKE, 1997]		
Lebensmittel/gruppe (Antwortmöglichkeit)	**Portions-größe (g)**	**Datenquelle**	**Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)**	**kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)**
☐ 2 Esslöffel	40		2,20	88,14
☐ 3 Esslöffel	60		2,20	132,22
☐ > 3 Esslöffel	80		2,20	176,29
6.6.1.B. Eis und/oder Pudding			**1,18**	
☐ < 1/2 Kugel	38		1,18	44,07
☐ 1/2 Kugel	75		1,18	88,15
☐ 1 Kugel	150	Landliebe Sahnepudding	1,18	176,29
☐ 2 Kugeln	300		1,18	352,58
☐ 3 Kugeln	450		1,18	528,88
☐ > 3 Kugeln	600		1,18	705,17
7.1.1.B. Bier und/oder Most			**0,42**	
☐ weniger als ¼ Liter	125		0,42	52,53
☐ ¼ Liter (250ml)	250		0,42	105,07
☐ ¼ bis ½ Liter	375		0,42	157,60
☐ ½ Liter	500		0,42	210,14
☐ ½ bis 1 Liter	750		0,42	315,21
☐ 1 Liter	1000		0,42	420,28
☐1-2 Liter	1500		0,42	630,42
☐ 2 Liter	2000		0,42	840,56
☐ mehr als 2 Liter	2500		0,42	1050,70
7.1.2.B. Bier mit Limonade			**0,34**	
☐ weniger als ¼ Liter	125		0,34	42,50
☐ ¼ Liter (250ml)	250		0,34	85,00
☐ ¼ bis ½ Liter	375		0,34	127,50
☐ ½ Liter	500		0,34	170,00
☐ ½ bis 1 Liter	750		0,34	255,00
☐ 1 Liter	1000		0,34	340,00
☐1-2 Liter	1500		0,34	510,00
☐ 2 Liter	2000		0,34	680,00
☐ mehr als 2 Liter	2500		0,34	850,00

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
7.1.3.B. Wein, Weintraubensaft und/oder Schaumweine			**0,72**	
☐ weniger als ¼ Liter	125		0,72	89,47
☐ ¼ Liter (250ml)	250		0,72	178,94
☐ ¼ bis ½ Liter	375		0,72	268,41
☐ ½ Liter	500		0,72	357,88
☐ ½ bis 1 Liter	750		0,72	536,82
☐ 1 Liter	1000		0,72	715,76
☐1-2 Liter	1500		0,72	1073,63
☐ 2 Liter	2000		0,72	1431,51
☐ mehr als 2 Liter	2500		0,72	1789,39
7.2.1.B. Fruchtsäfte			**0,48**	
☐ weniger als ¼ Liter	125		0,48	59,94
☐ ¼ Liter (250ml)	250		0,48	119,88
☐ ¼ bis ½ Liter	375		0,48	179,82
☐ ½ Liter	500		0,48	239,76
☐ ½ bis 1 Liter	750		0,48	359,65
☐ 1 Liter	1000		0,48	479,53
☐1-2 Liter	1500		0,48	719,29
☐ 2 Liter	2000		0,48	959,06
☐ mehr als 2 Liter	2500		0,48	1198,82
7.2.2.B. Johannisbeersaft und/oder Zitronenfruchtsaft			**1,01**	
☐ weniger als ¼ Liter	125		1,01	126,81
☐ ¼ Liter (250ml)	250		1,01	253,61
☐ ¼ bis ½ Liter	375		1,01	380,42
☐ ½ Liter	500		1,01	507,22
☐ ½ bis 1 Liter	750		1,01	760,83
☐ 1 Liter	1000		1,01	1014,44
☐1-2 Liter	1500		1,01	1521,67
☐ 2 Liter	2000		1,01	2028,89
☐ mehr als 2 Liter	2500		1,01	2536,11
7.2.3.B. Sirupsäfte			**3,22**	
☐ < 1/2 Esslöffel	5		3,22	16,10
☐ 1/2 Esslöffel	10		3,22	32,20

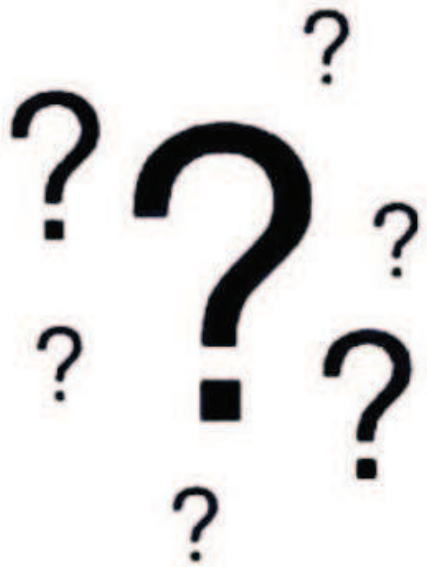
Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
☐ 1 Esslöffel	20	Hollundersirup selbst abgewogen	3,22	64,40
☐ 2 Esslöffel	40		3,22	128,80
☐ 3 Esslöffel	60		3,22	193,20
☐ > 3 Esslöffel	80		3,22	257,60
7.2.4.B. Molkeprodukte			**0,20**	
☐ weniger als ¼ Liter	125		0,20	25,36
☐ ¼ Liter (250ml)	250		0,20	50,71
☐ ¼ bis ½ Liter	375		0,20	76,07
☐ ½ Liter	500		0,20	101,42
☐ ½ bis 1 Liter	750		0,20	152,13
☐ 1 Liter und mehr	1500		0,20	304,26
7.2.5.B. Cola			**0,61**	
☐ weniger als ¼ Liter	125		0,61	76,25
☐ ¼ Liter (250ml)	250		0,61	152,50
☐ ¼ bis ½ Liter	375		0,61	228,75
☐ ½ Liter	500		0,61	305,00
☐ ½ bis 1 Liter	750		0,61	457,50
☐ 1 Liter	1000		0,61	610,00
☐1-2 Liter	1500		0,61	915,00
☐ 2 Liter	2000		0,61	1220,00
☐ mehr als 2 Liter	2500		0,61	1525,00
7.2.6.B. Limonaden und Energiedrinks			**0,43**	
☐ weniger als ¼ Liter	125		0,43	53,22
☐ ¼ Liter (250ml)	250		0,43	106,44
☐ ¼ bis ½ Liter	375		0,43	159,65
☐ ½ Liter	500		0,43	212,87
☐ ½ bis 1 Liter	750		0,43	319,31
☐ 1 Liter	1000		0,43	425,74
☐1-2 Liter	1500		0,43	638,62
☐ 2 Liter	2000		0,43	851,49
☐ mehr als 2 Liter	2500		0,43	1064,36
7.2.7.B. Kaffee			**0,02**	
☐ Espresso	50		0,02	1,00
☐ Cappuccino/Café Latte	150	BLS	**0,45**	66,78
☐ Tasse Kaffee schwarz	150		0,02	3,00

Lebensmittel/gruppe (Antwortmöglichkeit)	Portions-größe (g)	Datenquelle	Energie-gehalt-mittelwert aus der Lebens-mittel/-gruppe (kcal/g)	kcal Verzehr aus der Lebensmittelgruppe (Portions-größe * Energie-gehalt)
7.2.7.D. Kaffee zuckern			**4,05**	
☐ < 1/2 Esslöffel	4		4,05	15,19
☐ 1/2 Esslöffel	8		4,05	30,38
☐ 1 Esslöffel	15	Mengenlehre [UNION DEUTSCHE LEBENSMITTEL WERKE, 1997]	4,05	60,75
☐ 2 Esslöffel	30		4,05	121,50
☐ 3 Esslöffel	45		4,05	182,25
☐ > 3 Esslöffel	60		4,05	243,00
7.2.8.B. Pfanner Tea & Juice			**0,34**	
☐ weniger als ¼ Liter	125		0,34	42,85
☐ ¼ Liter (250ml)	250		0,34	85,70
☐ ¼ bis ½ Liter	375		0,34	128,55
☐ ½ Liter	500		0,34	171,40
☐ ½ bis 1 Liter	750		0,34	257,10
☐ 1 Liter	1000		0,34	342,80
☐1-2 Liter	1500		0,34	514,20
☐ 2 Liter	2000		0,34	685,60
☐ mehr als 2 Liter	2500		0,34	857,00
7.2.9.B. Kakao			**61,50**	
☐ weniger als ¼ Liter	125		61,50	7687,56
☐ ¼ Liter (250ml)	250		61,50	15375,13
☐ ¼ bis ½ Liter	375		61,50	23062,69
☐ ½ Liter	500		61,50	30750,25
☐ ½ bis 1 Liter	750		61,50	46125,38
☐ 1 Liter und mehr	1500		61,50	92250,75
7.2.10.B.Römerquelle Emotion			**0,17**	
☐ weniger als ¼ Liter	125		0,17	21,63
☐ ¼ Liter (250ml)	250		0,17	43,25
☐ ¼ bis ½ Liter	375		0,17	64,88
☐ ½ Liter	500		0,17	86,50
☐ ½ bis 1 Liter	750		0,17	129,75
☐ 1 Liter	1000		0,17	173,00
☐1-2 Liter	1500		0,17	259,50
☐ 2 Liter	2000		0,17	346,00
☐ mehr als 2 Liter	2500		0,17	432,50

Food Frequency Questionnaire

ÖSES.cal09

Fragebogen



Information und Anleitung zum Fragebogen

Bitte nehmen Sie sich für den Fragebogen ausreichend Zeit und lesen ihn aufmerksam durch. Sehen Sie sich die Fragen und die möglichen Antworten genau an. Sollten Sie sich nicht ganz sicher sein, schätzen Sie die Antwort. Eine Vermutung ist besser als gar keine Antwort.

Die meisten Fragen können Sie beantworten, indem Sie ein einziges Kästchen ankreuzen ☒. Sollten Sie sich verschreiben, streichen sie die falsche Antwort durch und kreuzen Sie die richtige erneut an. Kreisen die korrekte Antwort noch zusätzlich ein. In wenigen Fällen werden Sie gebeten, die Fragen frei zu beantworten, wofür Sie eine Linie zum Ausfüllen vorfinden: _____

Die Fragen beziehen sich auf Ihr Ernährungsverhalten über das letzte halbe Jahr, also bitte berücksichtigen Sie dies beim Ausfüllen.

Die Fragen sind so aufgebaut, dass zunächst immer nach der Häufigkeit des verzehrten Lebensmittels gefragt wird, und dann erst nach der Portionsgröße. Sollte also ein Lebensmittel gar nicht verzehrt werden muss natürlich auch keine Häufigkeit angegeben werden, sodass man die nächste Frage überspringen kann.

Bitte füllen Sie den Fragebogen möglichst gewissenhaft aus. Vergewissern Sie sich, dass Sie keine Frage vergessen haben und blättern Sie den Fragebogen am Ende noch einmal durch.

Ihre Antworten helfen uns Ihre Energieaufnahme zu ermitteln und richtig zu interpretieren.

Wir möchten uns schon jetzt für Ihre Mithilfe bedanken!

ID oder Name _____

1 - Bitte beantworten Sie zunächst folgende Fragen zu Ihrer Person:

1.1. Alter: _____

1.2. Geschlecht:

☐ weiblich ☐ männlich

2 – Gemüse und Obstverzehr

2.1. Obst außer Bananen

2.1.1.A. Wie oft essen Sie Obst (keine Bananen)?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

2.1.1.B. Wenn sie Obst (ohne Bananen) essen, wie viel essen Sie davon? 1 Portion = 1 mittelgroßer Apfel = faustgroße Portion des Obstes oder 125g

☐ < ½ Portion	☐ 1 Portionen	☐ 3 Portionen
☐ ½ Portion	☐ 2 Portionen	☐ > 3 Portionen

2.2. Bananen

2.2.1.A. Wie oft essen Sie Bananen?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

2.2.2.B. Wenn Sie Bananen essen, wie viel essen Sie normalerweise davon? 1 Portion = 1 mittelgroße Banane

☐ < ½ Banane	☐ 1 Banane	☐ 3 Bananen
☐ ½ Banane	☐ 2 Bananen	☐ > 3 Bananen

2.3. Gemüse

2.3.1.A. Wie oft essen Sie <u>rohes</u> und/oder <u>gedünstetes</u> Gemüse? (auch klare Suppen und Tomatensauce <u>ABER</u> keinen abgemachten Salat)

☐ nie	☐ 2-3mal pro Monat	☐ 2-3mal pro Woche
☐ einmal pro Monat	☐ einmal pro Woche	☐ 4-5mal pro Woche
☐ täglich	☐ 2-3mal täglich	☐ öfter als 3mal täglich

2.3.1.B. Wenn Sie rohes oder gedünstetes Gemüse essen, wie viel essen Sie davon? (1 Portion= faustgroße Portion = 100g)

☐ < ½ Portion	☐ 1 Portionen	☐ 3 Portionen
☐ ½ Portion	☐ 2 Portionen	☐ > 3 Portionen

2.3.2.A. Wie oft essen Sie Gemüse als Cremesuppe, Sauce und/oder warmes Gerichte wie z.B.: Letscho?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

2.3.2.B. Wenn Sie Gemüse als Cremesuppen, Saucen und/oder warmes Gerichte essen, wie viel essen Sie davon? (1 Portion = 200ml Suppe, 2 faustgroße Portionen Gemüse = 200g)

☐ < ½ Portion	☐ 1 Portionen	☐ 3 Portionen
☐ ½ Portion	☐ 2 Portionen	☐ > 3 Portionen

2.3.3.A. Wie oft essen Sie Häuptelsalat sowie diverse gemischte Salate <u>mit</u> Dressing?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

2.3.3.B. Wenn Sie einen abgemachten Salat essen, wie viel essen Sie davon? 1 Portion = 50g (1 mittelgroßer Häuptelsalat wiegt 125 g)

☐ < 1 Portion	☐ 2 Portionen	☐ 4 Portionen
☐ 1 Portionen	☐ 3 Portionen	☐ > 5 Portionen

2.3.4.A. Wie oft essen Sie Kartoffel gegart, geröstet, und/oder als Knödel und Püree?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

2.3.4.B. Wenn Sie Kartoffel gegart, geröstet, und/oder als Knödel oder Püree essen, wie viel essen sie davon? 1 Portion = 1 mittelgroße Kartoffel = 1 Knödel

☐ < 1/2 Portion	☐ 1 Portion	☐ 3 Portionen
☐ 1/2 Portion	☐ 2 Portionen	☐ > 3 Portionen

2.3.5.A. Wie oft essen Sie Kartoffeln als Puffer, Auflauf, Kroketten und/oder Pommes?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

2.3.5.B. Wenn Sie Kartoffeln als Puffer, Auflauf, Kroketten und/oder Pommes essen, wie viel essen Sie davon? 1 Portion = 1 Puffer, 150g Kroketten, mittelgroße Portion Pommes

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

2.3.6.A. Wie oft essen Sie Chips, Erdnussflips und/oder Popcorn?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

2.3.6.B. Wenn Sie Chips, Erdnussflips und/oder Popcorn essen, wie viel essen Sie davon? 1 Portion = 25g/Portion = handgroße Portion

☐ <1 Portion ☐ 2 Portionen ☐ 4 Portionen

☐ 1 Portionen ☐ 3 Portionen ☐ > 4 Portionen

3 – Getreideprodukte

3.1. Brot

3.1.1.A. Wie oft essen sie Roggen-, Weizenmischbrot und/oder Vollkornbrot? (keine Semmeln und Toast)

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

3.1.1.B. Wenn Sie Roggen- und Vollkornbrot essen, wie viel essen sie davon? 1 Portion = 1 mittelgroße Scheibe Brot = 50g

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

3.1.2.A. Wie oft essen Sie Weißbrot, Semmeln und/oder Toast?

☐ nie ☐ 2-3mal pro Monat ☐ 2-3mal pro Woche

☐ einmal pro Monat ☐ einmal pro Woche ☐ 4-5mal pro Woche

☐ täglich ☐ 2-3mal täglich ☐ öfter als 3mal täglich

3.1.2.B. Wenn Sie Weißbrot, Semmeln und Toast essen, wie viel essen Sie davon? 1 Portion = 1 Semmel = 2 Scheiben Toast oder Weißbrot

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

3.1.3.A. Wie oft essen Sie Salzstangerl, Laugengebäck, Knäckebrot und/oder Knabbergebäck?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

3.1.3.B. Wenn Sie Salzstangerl, Laugengebäck, Knäckebrot und/oder Knabbergebäck essen, wie viel essen Sie davon? 1 Portion = 1 Laugengebäck =1 Salzstangerl = 4 Knäckebrot = 2 handvoll Knabbergebäck

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

3.2. Reis

3.2.1.A. Wie oft essen Sie Reis, Milchreis und/oder Risotto?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

3.2.1.B. Wenn Sie Reis, Milchreis und/oder Risotto essen, wie viel essen sie davon? 1 Portion = 100g gekocht = 35g Rohprodukt

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

3.3. Müsli, Cornflakes, Haferflocken

3.3.1.A. Wie oft essen sie Müsli, Haferflocken und/ oder Cornflakes?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

3.3.1.B. Wenn sie Müsli, Haferflocken und/ oder Cornflakes essen, wie viel essen sie davon? 1 Portion = 10 Esslöffel= 45g

☐ < 1/2 Portion ☐ 1/2 Portion ☐ 1 Portion

☐ 2 Portionen ☐ 3 Portionen ☐ > 3 Portionen

3.4. Nudeln, Lasagne, Eierteigwaren, Spätzle, Nockerl

3.4.1.A. Wie oft essen Sie Nudel, Eierteigwaren, Nockerl und/ oder Spätzle?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

3.4.1.B. Wenn Sie Nudel, Eierteigwaren, Nockerl und/ oder Spätzle essen, wie viel essen Sie davon? 1 Portion = 100g gekocht = 35g Rohprodukt

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

3.5. Knödel aus Getreideprodukten

3.5.1.A. Wie oft essen Sie Knödel (z.B.: Semmelknödel)?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

3.5.1.B. Wenn Sie Knödel essen, wie viel essen Sie davon? 1 Portion = 1 Knödel

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

3.6. Pizza

3.6.1.A. Wie oft essen Sie Pizzastangerl und/oder Knoblauchbrot?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

3.6.1.B. Wenn Sie Pizzastangerl und/oder Knoblauchbrot essen, wie viel essen Sie davon? 1 Portion = 1 Pizzastangerl und/oder gleiche Menge an Knoblauchbrot

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

3.6.2.A. Wie oft essen Sie Pizza?

☐ nie ☐ 2-3mal pro Monat ☐ 2-3mal pro Woche

☐ einmal pro Monat ☐ einmal pro Woche ☐ 4-5mal pro Woche

☐ täglich ☐ 2-3mal täglich ☐ öfter als 3mal täglich

3.6.2.B. Wenn Sie Pizza essen, wie viel essen Sie davon? 1 Portion = 1 Pizza (Tiefkühlportion)

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

4 – Milchprodukte, Fette und Eier:

4.1. Butter, Margarine

4.1.1.A. Wie oft essen Sie Butter und/ oder Margarine?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

4.1.1.B. Wenn sie Butter und/oder Margarine essen, wie viel essen sie davon? 1 Portion = 1 Teelöffel glatt gestrichen

☐ < ½ TL ☐ 1 TL ☐ 3 TL

☐ 1/2 TL ☐ 2 TL ☐ > 3 TL

4.2. Milch

4.2.1.A. Wie oft trinken Sie Milch? (ABER nicht als Zusatz für Kaffee)

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

4.2.1.B. Wenn Sie Milch trinken, wie viel trinken Sie davon? 1 Portion = 200ml = 1 Glas

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

4.2.1.C. Welche Art von Milch trinken Sie normalerweise?

☐ Vollmilch (3,6% Fett) ☐ Milch Halbfett ☐ Magermilch (0.03% Fett)

4.3. Käse

4.3.1.A. Wie oft essen Sie Hartkäse (wie z.B.: Emmentaler, Käse nach Holl. Art, Gouda, etc.) Hier sind auch überbackene Käsegerichte gemeint, wie z.B.: Camembert?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

4.3.1.B. Wenn Sie Hartkäse essen, wie viel essen Sie davon? 1 Portion = 1 Scheibe = 30g

☐ < 1/2 Scheibe	☐ 1 Scheibe	☐ 3 Scheiben
☐ 1/2 Scheibe	☐ 2 Scheibe	☐ > 3 Scheiben Käse

4.3.2.A. Wie oft essen Sie Parmesan?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

4.3.2.B. Wenn Sie Parmesan essen, wie viel essen Sie davon? 1 Portion = 1 Esslöffel

☐ < 1/2 Esslöffel	☐ 1 Esslöffel	☐ 3 Esslöffel
☐ 1/2 Esslöffel	☐ 2 Esslöffel	☐ > 3 Esslöffel

4.3.3.A. Wie of essen Sie Mozarella?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

4.3.3.B. Wenn Sie Mozarella essen, wie viel essen Sie davon? 1 Portion = 125g (Abtropfgewicht) handelsübliche Menge

☐ < 1/4 Mozarella	☐ 1/2 Mozarella	☐ 2 Mozarella
☐ 1/4 Mozarella	☐ 1 Mozarella	☐ > 2 Mozarella

4.3.4.A. Wie oft essen Sie Streich- und Frischkäse?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

4.3.4.B. Wenn Sie Streich- und Frischkäse essen, wie viel essen Sie davon? 1 Portion = 1 Esslöffel

☐ < 1/2 Esslöffel	☐ 1 Esslöffel	☐ 3 Esslöffel
☐ 1/2 Esslöffel	☐ 2 Esslöffel	☐ > 3 Esslöffel

4.4. Topfen, Sauerrahm und Schlagobers

4.4.1.A. Wie oft essen Sie Topfen sowie Topfencremes, Liptauer und/oder Sauerrahm?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

4.4.1.B. Wenn Sie Topfen, Liptauer und/oder Sauerrahm essen, wie viel davon?

☐ < 1/2 Esslöffel	☐ 1 Esslöffel	☐ 3 Esslöffel
☐ 1/2 Esslöffel	☐ 2 Esslöffel	☐ > 3 Esslöffel

4.4.2.A. Wie oft essen Sie Schlagobers?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

4.4.2.B. Wenn Sie Schlagobers essen, wie viel essen Sie davon?

☐ < 1/2 Esslöffel	☐ 1 Esslöffel	☐ 3 Esslöffel
☐ 1/2 Esslöffel	☐ 2 Esslöffel	☐ > 3 Esslöffel

4.4.3.A. Wie oft essen Sie Mayonnaise?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

4.4.3.B. Wenn Sie Mayonnaise essen, wie viel essen Sie davon?

☐ < 1/2 Esslöffel	☐ 1 Esslöffel	☐ 3 Esslöffel
☐ 1/2 Esslöffel	☐ 2 Esslöffel	☐ > 3 Esslöffel

4.5. Yoghurt

4.5.1.A. Wie oft essen Sie Joghurt oder trinken Joghurt-ähnliche Drinks (<u>vollfett</u>) ?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

4.5.1.B. Wenn Sie Joghurt essen oder trinken, wie viel davon? 1 Portion = 1 Becher mit 200g

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

4.5.2.A. Wie oft essen Sie fettarme Joghurtprodukte und/oder trinken Sie Buttermilch?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

4.5.2.B. Wenn Sie fettarme Joghurtprodukte und/oder Buttermilch trinken/essen, wie viel davon? 1 Portion = 1 Becher mit 200g

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

4.6. Eier

4.6.1.A. Wie oft essen Sie Eier?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

4.6.1.B. Wenn Sie Eier essen, wie viel essen Sie davon? 1 Portion = 1 mittelgroßes Ei

☐ < 1/2 Ei ☐ 1 Ei ☐ 3 Eier

☐ 1/2 Ei ☐ 2 Eier ☐ > 3 Eier

4.7. Öle

4.7.1.A. Wie oft verwenden Sie pflanzliche Fette/Öle? (eingeschlossen Kürbiskernöl)

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

4.7.1.B. Wenn Sie pflanzliche Fette essen, wie viel essen Sie davon? 1 Portion = 1 Esslöffel

☐ < 1/2 Esslöffel ☐ 1 Esslöffel ☐ 3 Esslöffel

☐ 1/2 Esslöffel ☐ 2 Esslöffel ☐ > 3 Esslöffel

4.8. Nüsse

4.8.1.A. Wie oft essen Sie Nüsse?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

4.8.1.B. Wenn Sie Nüsse essen, wie viel essen Sie davon?

☐ < 1/2 Esslöffel ☐ 1 Esslöffel ☐ 3 Esslöffel

☐ 1/2 Esslöffel ☐ 2 Esslöffel ☐ > 3 Esslöffel

5 – Fleisch und Fisch:

5.1. Schwein

5.1.1.A. Wie oft essen Sie Schweinefleischgerichte (Schnitzel, Schweinsbraten, Naturschnitzel, Kotelette etc.)?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.1.1.B. Wenn Sie Schweinefleischgerichte essen, wie viel essen Sie davon? 1 Portion = 1 mittelgroßes Stück Fleisch = 125g

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

5.1.2.A. Wie oft essen Sie Schweineschinken?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.1.2.B. Wenn Sie Schweineschinken essen, wie viel essen Sie davon? 1 Portion = 1 mittelgroße Scheibe Schinken dünn geschnitten

☐ < 1/2 Scheibe ☐ 1 Scheibe ☐ 3 Scheiben

☐ 1/2 Scheibe ☐ 2 Scheiben ☐ > 3 Scheiben

5.1.3.A. Wie oft essen Sie Speck?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

5.1.3.B. Wenn Sie Speck essen, wie viel essen Sie davon? 1 Portion = 1 Scheibe Speck

☐ < 1/2 Scheibe	☐ 1 Scheibe	☐ 3 Scheiben
☐ 1/2 Scheibe	☐ 2 Scheiben	☐ > 3 Scheiben

5.2. Geflügel

5.2.1.A. Wie oft essen Sie Geflügel, Puten- und Hühnerfleisch? (Naturschnitzel, Geschnetzeltes etc.) <u>Keine</u> in Panier gebackene Speisen !

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

5.2.1.B. Wenn Sie Geflügel, Puten- und Hühnerfleisch essen (nicht gebacken), wie viel essen Sie davon? 1 Portion = 1 Stück mittelgroßes Stück Fleisch = 100g

☐ < 1/2 Portion	☐ 1 Portion	☐ 3 Portionen
☐ 1/2 Portion	☐ 2 Portionen	☐ > 3 Portionen

5.2.2.A. Wie oft essen Sie Geflügel, Puten- und Hühnerfleisch gebacken?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

5.2.2.B. Wenn Sie Geflügel, Puten- und Hühnerfleisch gebacken essen, wie viel essen Sie davon? 1 Portion = 1 Stück mittelgroßes Stück Fleisch = 100g

☐ < 1/2 Portion	☐ 1 Portion	☐ 3 Portionen
☐ 1/2 Portion	☐ 2 Portionen	☐ > 3 Portionen

5.2.3.A. Wie oft essen Sie Putenschinken?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

5.2.3.B. Wenn Sie Putenschinken essen, wie viel essen Sie davon? 1 Portion = 1 mittelgroße Scheibe Schinken dünn geschnitten

☐ < 1/2 Scheibe	☐ 1 Scheibe	☐ 3 Scheiben
☐ 1/2 Scheibe	☐ 2 Scheiben	☐ > 3 Scheiben

5.3. Rindfleisch

5.3.1.A. Wie oft essen Sie faschierte Laibchen?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

5.3.1.B. Wenn Sie faschierte Laibchen essen, wie viel essen Sie davon? 1 Portion = 1 faschiertes Laibchen = 125g

☐ < 1/2 Portion	☐ 1 Portion	☐ 3 Portionen
☐ 1/2 Portion	☐ 2 Portionen	☐ > 3 Portionen

5.3.2.A. Wie oft essen Sie Rindfleischgerichte gekocht?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

5.3.2.B. Wenn Sie Rindfleisch gekocht essen, wie viel essen Sie davon? 1 Portion = 1 Stück mittelgroßes Fleisch = 125g

☐ < 1/2 Portion	☐ 1 Portion	☐ 3 Portionen
☐ 1/2 Portion	☐ 2 Portionen	☐ > 3 Portionen

5.3.3.A. Wie oft essen Sie Spareribs?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal pro Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

5.3.3.B. Wenn Sie Spareribs essen, wie viel essen Sie davon? 1 Portion = 180g = 125g essbarer Anteil = mittelgroß

☐ < 1/2 Portion	☐ 1 Portion	☐ 3 Portionen
☐ 1/2 Portion	☐ 2 Portionen	☐ > 3 Portionen

5.3.4.A. Wie oft essen Sie sonst Rindfleischgerichte wie Zwiebelrostbraten, Steak, Schnitzel und sonstige gebratene oder gebackene Speisen?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.3.4.B. Wenn Sie diese Gerichte essen, wie viel essen Sie normalerweise davon? 1 Portion = 1 Stück mittelgroßes Stück Fleisch = 125g

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

5.4. Wurst und gemischte Fleischarten

5.4.1.A. Wie oft essen Sie Wurst und/oder Leberkäse?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.4.1.B. Wenn Sie Wurst und/oder Leberkäse essen, wie viel essen Sie davon? 1 Portion = z.B.: 1 Paar Frankfurter, 1 Stück Leberkäse= 150 g

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

5.4.2.A. Wie oft essen Sie Fleischknödel? (z.B.: Leberknödel)

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.4.2.B. Wenn Sie Fleischknödel essen, wie viel essen Sie davon? 1 Portion = 1 mittelgroßer Knödel

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

5.4.3.A. Wie oft essen Sie Kebap?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.4.3.B. Wenn Sie Kebap essen, wie viel essen Sie davon?

☐ < ½ Kebap ☐ 1 Kebap ☐ 3 Kepap

☐ 1/2 Kebap ☐ 2 Kebap ☐ > 3 Kebap

5.4.4.A. Wie oft essen Sie Burger?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.4.4.B. Wenn Sie Burger essen, wie viel essen Sie davon? 1 Portion hat die Größe von einem Hamburger von McDonalds

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

5.4.5.A. Welche Fleischgerichte essen Sie noch außer den oben erwähnten und wie oft essen Sie dieses Gericht?

_____

5.4.5. B. Wie viel essen Sie davon?

_____

5.5. Fisch

5.5.1.A. Wie oft essen Sie Fisch gebraten oder als Salat?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.5.1.B. Wenn Sie Fisch gebraten und/oder als Salat essen, wie viel essen Sie davon? 1 Portion = mittelgroßes Stück Fisch = 150g essbarer Anteil

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

5.5.2.A. Wie oft essen Sie Fisch gebacken?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.5.2.B. Wenn Sie Fisch gebacken essen, wie viel essen Sie davon? 1 Portion = mittelgroßes Stück Fisch = 150g essbarer Anteil

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

5.5.3.A. Wie oft essen Sie Thunfisch?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

5.5.3.B. Wenn Sie Thunfisch essen, wie viel essen Sie davon? 1 Portion = 1 Dose = 150g Abtropfgewicht

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

6 - Süßigkeiten:

6.1. Schokolade

6.1.1.A. Wie oft essen Sie Milchschokolade und/oder gefüllte Schokolade mit z.B.: Nüssen?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.1.1.B. Wenn Sie Milchschokolade und/oder gefüllte Schokolade essen, wie viel essen Sie davon? 1 Portion = 1 Tafel = 100g

☐ < als ¼ Tafel ☐ ½ bis 1 Tafel ☐ 2 Tafeln

☐ ¼ bis ½ Tafel ☐ 1 Tafel ☐ > als 2 Tafeln

6.1.2.A. Wie oft essen Sie Bitterschokolade?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.1.2.B. Wenn Sie Bitterschokolade essen, wie viel essen Sie davon? 1 Portion = 1 Tafel = 100g

☐ < als ¼ Tafel ☐ ½ bis 1 Tafel ☐ 2 Tafeln

☐ ¼ bis ½ Tafel ☐ 1 Tafel ☐ > als 2 Tafel

6.1.3.A. Wie oft essen Sie Schokoladeriegel wie z.B.: Twix, Mars, Bounty, Balisto, Snickers, Mannerschnitten etc., sowie Schokokekse?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.1.3.B. Wie viel essen Sie davon? 1 Portion = 1 Schokoladeriegel

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

6.1.4.A. Wie oft essen Sie Rumkugeln?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.1.4.B. Wenn Sie Rumkugeln essen, wie viel essen Sie davon?

☐ < 2 Rumkugeln ☐ 5 Rumkugeln ☐ 10-15 Rumkugeln

☐ 2-5 Rumkugeln ☐ 5-10 Rumkugeln ☐ > 15 Rumkugeln

6.2. Powerbar und Müsliriegel

6.2.1.A. Wie oft essen Sie Powerbars und/oder Müsliriegel?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.2.1.B. Wenn Sie Powerbars und/oder Müsliriegel essen, wie viel essen Sie normalerweise davon? 1 Portion = 1 Müsliriegel bzw. Powerbar

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

6.3. Kekse

6.3.1.A. Wie oft essen Sie Kekse, Butterkekse, Vanillekipferl und/oder Lebkuchenkekse?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.3.1.B. Wenn Sie Kekse essen, wie viel essen Sie davon?

☐ < 2 Kekse ☐ 5 Kekse ☐ 10-15 Kekse

☐ 2-5 Kekse ☐ 5-10 Kekse ☐ > 15 Kekse

6.3.2.A. Wie oft essen Sie Kokosbusserl?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.3.2.B. Wenn Sie Kokosbusserl essen, wie viel essen Sie davon?

☐ < 2 Kokosbusserl ☐ 5 Kokosbusserl ☐ 10-15 Kokosbusserl

☐ 2-5 Kokosbusserl ☐ 5-10 Kokosbusserl ☐ > 15 Kokosbusserl

6.4. Gebäck

6.4.1.A. Wie oft essen Sie Kipferl aus Mürbteig, Topfentascherl, Zimtschnecke, Krapfen, Buchten?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.1.B. Wenn Sie Kipferl, Topfentascherl, Zimtschnecke, Krapfen und/oder Buchteln essen, wie viel essen Sie davon? 1 Portion = 1 Kipferl, ½ Zimtschnecke, 1 Topfenkolatsche bzw. 1 Krapfen und 1 Buchtel

☐ < 1/2 Portion ☐ 1 Portion ☐ 3 Portionen

☐ 1/2 Portion ☐ 2 Portionen ☐ > 3 Portionen

6.4.2.A. Wie oft essen Sie Kipferl aus Blätterteig, Croissant (aber nicht gefüllt mit Schokolade)?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.2.B. Wenn Sie Kipferl aus Blätterteig essen, wie viel essen Sie davon?

☐ < ½ Kipferl ☐ 1 Kipferl ☐ 3 Kipferl

☐ ½ Kipferl ☐ 2 Kipferl ☐ > 3 Kipferl

6.4.3.A. Wie oft essen Sie Croissant gefüllt mit Schokolade?

☐ nie ☐ einmal pro Monat ☐ 2-3mal pro Monat

☐ einmal pro Woche ☐ 4-5mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Woche ☐ täglich ☐ öfter als 3mal täglich

6.4.3.B. Wenn Sie Croissant gefüllt mit Schokolade essen, wie viel essen Sie davon?

☐ < ½ Croissant ☐ 1 Croissant ☐ 3 Croissant

☐ ½ Croissant ☐ 2 Croissant ☐ > 3 Croissant

6.4.4.A. Wie oft essen Sie Kuchen? (KEINEN Obstkuchen inkludieren, jedoch Marillenkuchen berücksichtigen)

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal/Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.4.B. Wenn Sie Kuchen essen, wie viel essen Sie davon? 1 Stück = mittelgroße Portion

☐ < ½ Stück ☐ 1 Stück ☐ 3 Stück

☐ ½ Stück ☐ 2 Stück ☐ > 3 Stück

6.4.5.A. Wie oft essen Sie Obstkuchen (außer Marillenkuchen) und/oder Obstknödel?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.5.B. Wenn Sie Obstkuchen (außer Marillenkuchen) und/oder Obstknödel essen, wie viel essen Sie davon? 1 Stück = 1 Knödel

☐ < ½ Stück ☐ 1 Stück ☐ 3 Stück

☐ ½ Stück ☐ 2 Stück ☐ > 3 Stück

6.4.6.A. Wie oft essen Sie Torten und süße Schnitten?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.6.B. Wenn Sie Torten und/oder süße Schnitten essen, wie viel essen Sie davon? 1 Stück = mittelgroße Portion

☐ < ½ Stück ☐ 1 Stück ☐ 3 Stück

☐ ½ Stück ☐ 2 Stück ☐ > 3 Stück

6.4.7.A. Wie oft essen Sie Schaumrollen?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.7.B. Wenn Sie Schaumrollen essen, wie viel essen Sie davon?

☐ < ½ Schaumrolle ☐ 1 Schaumrolle ☐ 3 Schaumrollen

☐ ½ Schaumrolle ☐ 2 Schaumrollen ☐ > 3 Schaumrollen

6.4.8.A. Wie oft essen Sie Palatschinken und/oder Kaiserschmarren?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.8.B. Wenn Sie Palatschinken und/oder Kaiserschmarren essen, wie viel essen Sie davon?

☐ < ½ Palatschinke ☐ 1 Palatschinke ☐ 3 Palatschinken

☐ ½ Palatschinke ☐ 2 Palatschinken ☐ > 3 Palatschinken

6.4.9.A. Wie oft essen Sie süße Strudel?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.9.B. Wenn Sie Strudel essen, wie viel essen Sie normalerweise? 1 Stück = eine mittelgroße Portion

☐ < ½ Stück ☐ 1 Stück ☐ 3 Stück

☐ ½ Stück ☐ 2 Stück ☐ > 3 Stück

6.4.10.A. Wie oft essen Sie Tiramisu?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.10.B. Wenn Sie Tiramisu essen, wie viel essen Sie davon? 1 Stück = eine mittelgroße Portion

☐ < ½ Stück ☐ ½ Stück ☐ 1 Stück

☐ 2 Stück ☐ 3 Stück ☐ > 3 Stück

6.4.11.A. Wie oft essen Sie Waffeln?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.4.11.B. Wenn Sie Waffeln essen, wie viel essen Sie davon?

☐ < ½ Waffel ☐ 1 Waffel ☐ 3 Waffeln

☐ ½ Waffel ☐ 2 Waffeln ☐ > 3 Waffeln

6.5. Zucker, Honig, Marmelade

6.5.1.A. Wie oft essen Sie Zucker? (ABER nicht zum Süßen von Kaffee)

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.5.1.B. Wenn Sie Zucker essen, wie viel essen Sie davon? 1 Portion = 1 Esslöffel

☐ < 1/2 Esslöffel ☐ 1 Esslöffel ☐ 3 Esslöffel

☐ 1/2 Esslöffel ☐ 2 Esslöffel ☐ > 3 Esslöffel

6.5.2.A. Wie oft essen Sie Honig? (z.B.: Honigbrot, im Tee)

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.5.2.B. Wenn Sie Honig verwenden, wie viel essen Sie davon?

☐ < 1/2 Esslöffel ☐ 1 Esslöffel ☐ 3 Esslöffel

☐ 1/2 Esslöffel ☐ 2 Esslöffel ☐ > 3 Esslöffel

6.5.3.A. Wie oft essen Sie Nutella?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.5.3.B. Wenn Sie Nutella essen, wie viel essen Sie davon?

☐ < 1/2 Esslöffel ☐ 1/2 Esslöffel ☐ 1 Esslöffel

☐ 2 Esslöffel ☐ 3 Esslöffel ☐ > 3 Esslöffel

6.5.4.A. Wie oft essen Sie Marmelade?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.5.4.B. Wenn Sie Marmelade essen, wie viel essen Sie normalerweise davon?

☐ < 1/2 Esslöffel ☐ 1 Esslöffel ☐ 3 Esslöffel

☐ 1/2 Esslöffel ☐ 2 Esslöffel ☐ > 3 Esslöffel

6.6. Eis und Pudding

6.6.1.A. Wie oft essen Sie Eis und/oder Pudding?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

6.6.1.B. Wenn Sie Eis und/oder Pudding essen, wie viel essen Sie davon? 1 Portion = 1 Kugel, 1 kleiner Becher Pudding

☐ < 1/2 Kugel ☐ 1 Kugel ☐ 3 Kugeln

☐ 1/2 Kugel ☐ 2 Kugeln ☐ > 3 Kugeln

7 - Getränke:

7.1. Alkoholische Getränke

7.1.1.A. Wie oft trinken Sie Bier und/oder Most?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.1.1.B. Wenn Sie Bier und/oder Most trinken, wie viel trinken Sie davon?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.1.2.A. Wie oft trinken Sie Bier gemischt mit Limonaden? (z.B.: Radler)

☐ nie ☐ einmal pro Monat ☐ 2-3mal pro Monat

☐ einmal pro Woche ☐ 4-5mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Woche ☐ täglich ☐ öfter als 3mal täglich

7.1.2.B. Wenn Sie Bier mit Limonade trinken, wie viel trinken Sie davon?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.1.3.A. Wie oft trinken Sie Wein, Weintraubensaft und/oder Schaumweine?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.1.3.B. Wenn Sie Wein, Weintraubensaft und/oder Schaumweine trinken, wie viel trinken Sie?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.2. Antialkoholische Getränke

7.2.1.A. Wie oft trinken Sie Fruchtsäfte (außer Johannisbeersaft uns Zitronenfruchtsaft)?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.1.B. Wenn Sie Fruchtsäfte trinken, wie viel trinke Sie?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.2.2.A. Wie oft trinke Sie Johannisbeersaft und/oder Zitronenfruchtsaft?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.2.B. Wenn Sie Johannisbeersaft und/oder Zitronenfruchtsaft trinken, wie viel trinken Sie normalerweise davon?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.2.3.A. Wie oft trinken Sie Sirupsäfte?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.3.B. Wenn Sie Sirupsäfte trinken, wie viel Sirup verwenden Sie?

☐ < 1/2 Esslöffel ☐ 1 Esslöffel ☐ 3 Esslöffel

☐ 1/2 Esslöffel ☐ 2 Esslöffel ☐ > 3 Esslöffel

7.2.4.A. Wie oft trinken Sie Molkeprodukte wie Latella?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.4.B. Wenn Sie Molkeprodukte trinken, wie viel trinken Sie davon?

☐ weniger als ¼ Liter ☐ ¼ bis ½ Liter ☐ ½ bis 1 Liter

☐ ¼ Liter (250ml) ☐ ½ Liter (500ml) ☐ 1 Liter und mehr

7.2.5.A. Wie oft trinken Sie Cola?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.5.B. Wenn Sie Cola trinken, wie viel trinken Sie davon?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.2.6.A. Wie oft trinken Sie sonstige Softdrink wie Limonaden und/oder Red Bull?

☐ nie ☐ einmal pro Monat ☐ 2-3mal pro Monat

☐ einmal pro Woche ☐ 4-5mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Woche ☐ täglich ☐ öfter als 3mal täglich

7.2.6.B. Wenn Sie Limonaden und Energiedrinks trinken, wie viel trinken Sie davon?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.2.7.A. Wie oft trinke Sie Kaffee?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.7.B. Wenn Sie Kaffe trinken, welchen Kaffee trinken Sie?

☐ Espresso ☐ Cappuccino/Café Latte ☐ Tasse Kaffee schwarz

7.2.7.C. Zuckern Sie ihren Kaffee?

☐ ja ☐ nein

7.2.7.D. Wenn Sie ihren Kaffee zuckern, wie viel Zucker verwenden Sie?

☐ < 1/2 Esslöffel ☐ 1 Esslöffel ☐ 3 Esslöffel

☐ 1/2 Esslöffel ☐ 2 Esslöffel ☐ > 3 Esslöffel

7.2.8.A. Wie oft trinken Sie Pfanner Tea & Juice?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.8.B. Wenn Sie Pfanner Tea & Juice trinken, wie viel trinken Sie davon?

☐ weniger als ¼ Liter ☐ ½ Liter (500ml) ☐1-2 Liter

☐ ¼ Liter (250ml) ☐ ½ bis 1 Liter ☐ 2 Liter

☐ ¼ bis ½ Liter ☐ 1 Liter ☐ mehr als 2 Liter

7.2.9.A. Wie oft trinken Sie Kakao?

☐ nie ☐ einmal pro Woche ☐ täglich

☐ einmal pro Monat ☐ 2-3mal pro Woche ☐ 2-3mal täglich

☐ 2-3mal pro Monat ☐ 4-5mal pro Woche ☐ öfter als 3mal täglich

7.2.9.B. Wenn Sie Kakao trinken, wie viel trinken Sie davon?

☐ weniger als ¼ Liter	☐ ¼ bis ½ Liter	☐ ½ bis 1 Liter
☐ ¼ Liter (250ml)	☐ ½ Liter (500ml)	☐ 1 Liter und mehr

7.2.10.A. Wie oft trinken Sie Römerquelle Emotion oder sonstige aromatisierten Mineralwasser?

☐ nie	☐ einmal pro Woche	☐ täglich
☐ einmal pro Monat	☐ 2-3mal/ Woche	☐ 2-3mal täglich
☐ 2-3mal pro Monat	☐ 4-5mal pro Woche	☐ öfter als 3mal täglich

7.2.10.B. Wie viel trinken Sie davon?

☐ weniger als ¼ Liter	☐ ½ Liter (500ml)	☐1-2 Liter
☐ ¼ Liter (250ml)	☐ ½ bis 1 Liter	☐ 2 Liter
☐ ¼ bis ½ Liter	☐ 1 Liter	☐ mehr als 2 Liter

Bitte helfen Sie uns die Qualität des Fragebogens zu verbessern! Wir freuen uns auf Ihre Meinung:

_____
_____
_____
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_____

Vielen Dank für die Teilnahme an unserer Studie !!!

Curriculum vitae

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10/2005	Student at the department of Nutritional Science at the University of Vienna (Masters degree)
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11/2009 – 12/2009	Education Intern at Eurofins Vienna, Austria
10/2009	Infoline assistant at the Austrian Agency for Health and Food Saftey (AGES)
02/2009	Project assistant (NutritionDay) at the consortium of clinical nutrition (AKE) Vienna, Austria
06/2009 – 09/2009	Intern at the Karlsbader wafers fabric, Germany
02/2008	Project assistant (NutritionDay) at the consortium of clinical nutrition (AKE) Vienna, Austria

Personal Skills and Interests

Language: Native language in German, English fluent in written and spoken, basic writing and speaking skills in Italian

Proficient in nutritional softwares like NUT.s and nutritional databases (BLS)

Nutrient related diseases on a global perspective and prevention (choice of Master thesis)

Proficient in crafting documents using Microsoft Word, Excel, Power Point