KomPAN®

DIETARY HABITS AND NUTRITION BELIEFS QUESTIONNAIRE

AND

THE MANUAL FOR DEVELOPING OF NUTRITIONAL DATA

3rd edition

Technical Report
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In the second edition compared to the 1st edition, the following changes were made in Chapter 3, in the section entitled Diet quality indexes (3.5.2.2):

- information about the possibility of using a simplified version of the acronyms of dietary quality indexes (pHDI instead of pHDI-10 and nHDI instead of nHDI-14), according to the terms used in publications:

  Osadnik et al. Metabolically Healthy Obese and Metabolic Syndrome of the Lean: the Importance of Diet Quality. Analysis of MAGNETIC cohort. *Nutr. J.*, 2020, 19:19, doi:10.1186/s12937-020-00532-0;

  Wadolowska et al. Changes in Sedentary and Active Lifestyle, Diet Quality and Body Composition Nine Months after an Education Program in Polish Students Aged 11–12 Years: Report from the ABC of Healthy Eating Study. *Nutrients,* 2019, 11(2): 331, doi:10.3390/nu11020331;

  Kowalkowska et al. Reproducibility of a Short-Form, Multicomponent Dietary Questionnaire to Assess Food Frequency Consumption, Nutrition Knowledge, and Lifestyle (SF-FFQ4PolishChildren) in Polish Children and Adolescents. *Nutrients,* 2019, 11, 2929; doi:10.3390/nu11122929;

- a new proposal has been made to develop dietary data using the overall Diet Quality Index (DQI); this index enables a common interpretation of the consumption of foods with a potentially beneficial and negative influence on health – it combines these opposing diet characteristics and expresses them in numerical values;
- minor stylistic corrections were introduced.

The following changes have been introduced in the 3rd edition compared to the 2nd edition:

- in chapters 1 and 2, a question regarding the gender with which the respondent identifies was added;
- an additional division of the overall "Diet Quality Index" (DQI) into 5 categories has been proposed, which will facilitate the interpretation of this index for researchers and individual users interested in their diet (Chapter 3, section 3.5.2.2. Diet Quality Indexes);
- the title of the questionnaire has been corrected, indicating the respondents to whom it is addressed (*'young people aged 16-18 and adults'* instead of *'people aged 15-65'*); this change is intended to make it easier for some researchers to decide whether to use the questionnaire in people just over 65 years of age; however, it should be emphasized that the validation of the questionnaire was carried out in people aged 16-65 (doi:10.3390/nu11122929), so the decision to use this questionnaire in people >65 years old rests with the researcher; the researcher should take into account that in older people less reliability of nutritional data, the collection of which is based on the respondent's long-term memory, should be expected;
- minor stylistic corrections were introduced.

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KomPAN® Dietary Habits and Nutrition Beliefs Questionnaire for adolescents aged 16-16 years and adults

version 2.1. interviewer administered questionnaire

Information in boxes are for the interviewer
Additional instructions for the interviewer in italics

NOTE: Interviewer should maintain a neutral attitude during the interview and should not make any suggestions regarding the answers because some of the questions are used as a confirmation of respondents' answers validity.

READ OUT: We are conducting research, and we would like to learn about people's dietary habits and nutrition beliefs. The data obtained will be anonymous and undisclosed and will be used only for the purpose of this research.

I will now ask you questions, please choose one or more answers according to the instructions given.

1.Respondent code |__ | __ | __ | __ | 2. **Interviewer code** | __ | __ | 3**. Centre code** | __ | __ |
Date of the interview: 4. **Day** | __ | __ | 5**. Month** | __ | __ | 6**. Year** |__ | __ | __ | __ | *enter e.g. 01.12.2014*

Part A. Dietary habits

READ OUT: I will now ask you about your **dietary habits over the LAST YEAR**.

7. How many meals do you usually consume daily?
Please give **one** answer.
Meal - any of the regular occasions in a day when a reasonably large amount of food is eaten, e.g. morning, noon, evening.

(1)__ 1 meal
(2)__ 2 meals
(3)__ 3 meals
(4)__ 4 meals
(5)__ 5 meals or more

8. Do you consume meals at regular times?
Please give **one** answer.

(1)__ No
(2)__ Yes, but only some of them
(3)__ Yes, all of them

9. How often do you snack between the meals?
Please give **one** answer.
Snacking – usually a small portion of food eaten occasionally between the meals.

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

Question for people who snack between meals

10. What types of food do you usually consume between the meals during the weekdays?
You can give **more than one** answer.
(10/1)__ Fruit
(10/2)__ Vegetables
(10/3)__ Unsweetened dairy beverages and desserts, e.g. yoghurts, curd/cream cheese, milk
(10/4)__ Sweetened dairy beverages and desserts, e.g. homogenised cheese, sweetened milk beverages, flavoured milk
(10/5)__ Sweet snacks, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, wafers
(10/6)__ Savoury snacks, e.g. crackers, pretzels, crisps, potato chips
(10/7)__ Nuts, almonds, seeds
(10/8)__ Other, please list ……

11. What type of milk and dairy beverages you usually consume?
Please give **one** answer.
(1)__ Full fat
(2)__ Low fat
(3)__ No fat
(4)__ I don't consume it foods

12. How do you usually have your meat prepared?
You can give **more than one** answer.
(1)__ Boiled
(2)__ Stewed
(3)__ Grilled
(4)__ Roasted
(5)__ Fried
(6)__ I don't eat meat

13. What bread spread do you usually use?
Please give **one** answer.
(1)__ I don't use any spreads
(2)__ I use various spreads
(3)__ Mayonnaise
(4)__ Margarine
(5)__ Butter
(6)__ Spreadable butter (butter and margarine mix)
(7)__ Lard

14. What type of fat do you usually use for frying?
Please give **one** answer.
(1)__ I don't use any fats for frying
(2)__ I use various types of fats
(3)__ Vegetable oils (including olive oil)
(4)__ Margarine
(5)__ Butter
(6)__ Lard

15. Do you add any sugar to your hot beverages, e.g. tea, hot chocolate, coffee?
Please give **one** answer.
If your preferences vary depending on the type of the drink, please give answer related to the drink you drink most often
(1)__ No
(2)__ Yes, I add one teaspoon of sugar (or honey)
(3)__ Yes I add two or more teaspoons of sugar (or honey)
(4)__ Yes, I use sweeteners (low-caloric substitute for sugar)

16. Do you add salt to your meals and sandwiches once prepared?
Please give **one** answer.
(1)__ No
(2)__ Yes, but only sometimes
(3)__ Yes, I add salt to most of my meals

17. What type of water do you usually drink?
You can give **more than one** answer.
(1)__ I don't drink water
(2)__ Still water
(3)__ Sparkling water
(4)__ Flavoured water

READ OUT: Please think back about **ONE typical day** in terms of your diet in the **LAST WEEK** and answer the following questions.

18. What day of the week was it?
(1)__ Monday
(2)__ Tuesday
(3)__ Wednesday
(4)__ Thursday
(5)__ Friday
(6)__ Saturday
(7)__ Sunday

19. How many meals did you have that day? *Please give a number* …….. meals that day
Meal *- any of the regular occasions in a day when a reasonably large amount of food is eaten, e.g. morning, noon, evening.*

20. How many times did you have fruit or vegetables that day? Please give a number……. times that day.
Please include fruit or vegetables consumed during meal times and when snacking.

21. Did you have any fast foods that day, e.g. potato chips, hamburgers, pizza, hot-dogs?
(1)__ No
(2)__ Yes. How many times? *Please give a number*…… times that day

Part B. Food frequency consumption

READ OUT: I will now ask you **questions about the foods** you eat.

We would like to learn, **how often do you consume these foods**?

While answering to the questions, please consider foods eaten over the **LAST YEAR** during **your meals and snacking**, eaten at home and away.

In this part please give only **one** answer to each question.

Present 'Show card No. 1' to the respondent

22. How often do you eat white bread and bakery products, e.g. wheat bread, rye bread, wheat/rye bread, toast bread, bread rolls?
(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

23. How often to you eat wholemeal (brown) bread/bread rolls?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

24. How often do you have white rice, white pasta, fine-ground groats, e.g. semolina, couscous?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

25. How often do you eat buckwheat, oats, wholegrain pasta or other coarse-ground groats?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

26. How often do you eat fast foods, e.g. potato chips, hamburgers, pizza, hot-dogs?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

27. How often do you eat fried foods (e.g. meat or flour-based foods such as dumplings, pancakes etc.)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

28. How often do you use butter as a bread spread or as an addition to your meals/ for frying/ for baking etc.?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

29. How often do you use lard as a bread spread, or as an addition to you meals/ for frying/ for baking etc.?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

30. How often do you use vegetable oils or margarines or mixes of butter and margarines as a bread spread, or as an addition to your meals/ for frying/ for baking etc.?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

31. How often do you drink milk (including flavoured milk, hot chocolate, latte)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

32. How often do you eat fermented milk beverages, e.g. yoghurts, kefir (natural or flavoured)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

33. How often do you eat fresh cheese curd products, e.g. cottage cheese, homogenised cheese, fromage frais?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

34. How often do you eat cheese (including processed cheese, blue cheese)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

35. How often do you eat cold meats, smoked sausages, hot-dogs?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

36. How often do you eat red meat, e.g. pork, beef, veal, mutton, lamb, game?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

37. How often do you eat white meat, e.g. chicken, turkey, rabbit?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

38. How often do you eat fish?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

39. How often do you eat eggs?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

40. How often do you eat pulses-based foods, e.g. from beans, peas, soybeans, lentils?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

41. How often do you eat potatoes (excluding chips and crisps)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

42. How often do you eat fruit?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

43. How often do you eat vegetables?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

44. How often do you eat sweets, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, other?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

45. How often do you eat instant soups or ready-made soups, e.g. tinned, jar, concentrates (excluding frozen soup mixes)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

46. How often do you eat tinned (jar) meats?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

47. How often do you eat tinned (jar) vegetables, e.g. pickles?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

48. How often do you drink fruit juices?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

49. How often do you drink vegetable juices or fruit and vegetable juices?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

50. How often do you drink sweetened hot beverages, such as black tea, coffee, herbal or fruit teas?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

51. How often do you drink sweetened carbonated or still beverages such as Coca-Cola, Pepsi, Sprite, Fanta, lemonade?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

52. How often do you drink energy drinks such as Red Bull, Monster, Rockstar or other?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

53. How often do you drink water, e.g. mineral, tap water?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

54. How often do you have alcoholic beverages?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

Part C. Nutrition beliefs

READ OUT: Now I will read you some statements regarding food and nutrition.

Please **provide your view regarding each of the statements**.

*Respondent can give **one** answer to each statement.*

Statement	True (1)	False (2)	Unsure (3)
55. It is enough to eat wholegrains/cereals once a day.			
56. Only children and adolescents should drink milk.			
57. Fruit and/or vegetables should be consumed with every meal.			
58. Consumption of mouldy bread can result in food poisoning caused by *Salmonella.*			
59. High intakes of salt protect from hypertension.			
60. Limiting high-fat foods in everyday diet is protective against cardiovascular diseases.			
61. Frequent consumption of oily fish contributes to atherosclerosis.			
62. Frequent consumption of grilled meats contributes to the onset of cancer.			

Statement	True (1)	False (2)	Unsure (3)
63. Vegetarian diet increases the risk of anaemia.			
64. Bio-yoghurts contain beneficial gut bacteria.			
65. Vegetable oils and olive oil contain a high amount of cholesterol.			
66. Wholemeal bread have more fibre than white bread.			
67. Fruit and vegetables are a source of 'empty calories'.			
68. Butter and fortified margarines have high content of vitamin A and D.			
69. Cheese is a better source of calcium than cottage cheese.			
70. Offal has high amounts of 'bad' cholesterol - LDL.			
71. In a healthy diet, complex carbohydrates should be replaced with simple sugars.			
72. In a balanced diet, proteins should be the main source of energy.			
73. Inadequate intakes of vitamin PP can cause skin inflammation and diarrhoea.			
74. Sun exposure increases the synthesis of vitamin D in the human body.			
75. Phosphorus is a component of neural tissue.			
76. The ratio of calcium to phosphorus in a healthy diet should be 1:1.			
77. Consumption of fruit with high content of vitamin C increases bioavailability of iron.			
78. Starting cooking vegetables in cold water helps to preserve the nutrients.			
79. Sweets and animal fats are particularly high nutrient dense foods.			

Part D. Lifestyle and personal data

READ OUT: At the end, I would like to ask you questions referring to your **lifestyle** and some **personal data**.

If you feel that some of the questions are too personal, you can refuse to answer. We would be however grateful for every honest answer given.

In this part please give **one** answer to each question.

80. Are you currently following a diet?

(1)__ No
(2)__ Yes, as advised by my doctor for medical reasons
(3)__ Yes, it was my personal decision

Question to respondents who are following a diet.

81. Please provide the type of a diet ……

Question to respondents who are following a diet.

82. How long have you been following this diet?
Please specify the duration.
*Respondent can give **number of weeks** or **number of months** or **number of years**.*

Please provide a number of: …… weeks, …… months, …… years.

83. How often do you eat out, e.g. in a bar, restaurant, café, canteen?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

Question for respondents who drink alcoholic beverages.

84. What type of alcohol do you usually drink?

(1)__ Beer
(2)__ Wine
(3)__ Drinks
(4)__ Vodka

85. Do you currently smoke cigarettes, e-cigarettes, pipe or other tobacco?

(1)__ No
(2)__ Yes

86. Have you smoked cigarettes, e-cigarettes, pipe or tobacco in the past?

(1)__ No
(2)__ Yes

87. How many hours do you sleep a day during weekdays?

(1)__ 6 or less hours/day
(2)__ more than 6, but less than 9 hours/day
(3)__ 9 or more hours/day

88. How many hours do you sleep a day during the weekend?

(1)__ 6 or less hours/day
(2)__ more than 6, but less than 9 hours/day
(3)__ 9 or more hours/day

89. How many hours a day (on average) do you spend watching TV or using a computer (including work)?

Present the 'Show card No. 2' to the respondent.

(1)__ Less than 2 hours
(2)__ from 2 to almost 4 hours
(3)__ from 4 to almost 6 hours
(4)__ from 6 to almost 8 hours
(5)__ from 8 to almost 10 hours
(6)__ More than 10 hours

90. How would you describe your physical activity at work or at school?

Present the 'Show card No. 3' to the respondent

(1)__ **Low:** more than 70% of time is sedentary
(2)__ **Moderate:** about 50% of time is sedentary and 50% active
(3)__ **High:** about 70% of time is active or physical labour of high intensity

91. How would you describe your physical activity during your time off?

Present the 'Show card No. 4' to the respondent

(1)__ **Low:** mostly sedentary, watching TV, reading newspapers/books, light house works, walking for 1-2 hours/week
(2)__ **Moderate:** walking, cycling, exercise, gardening or other light physical activity for 2-3 hours/week
(3)__ **High:** cycling, running, gardening and other sport/recreational activities that require physical activity for longer than 3 hours/week

92. How would you describe your health status in comparison to other people your age?
(1)__ Worse than others
(2)__ The same as others
(3)__ Better than others

93. How would you describe your knowledge about nutrition?
(1)__ Insufficient
(2)__ Sufficient
(3)__ Good
(4)__ Very good

94. How would you describe your diet?
(1)__ Very bad
(2)__ Bad
(3)__ Good
(4)__ Very good

95. How would you describe your diet during the weekdays when compared to the weekend?
(1)__ No difference really
(2)__ Differs slightly
(3)__ Very different

96. How much do you weigh (kg)? |__ | __ | __ |, __ | kg

97. What is your height (cm)? |__ | __ | __ |, __ | cm

98. What is your waistline (cm)? |__ | __ | __ |, __ | cm
If you don't know, please provide your clothing size (waist measurement).
If feasible, waistline can be measured with measuring tape.

99. Sex:
(1)__ Male
(2)__ Female

100. The gender you identify with:
(1)__ The same
(2)__ Other

Date of birth: **101. Day** |__ | __ | **102. Month** |__ | __ | **103. Year** |__ | __ | __ | __ | *enter e.g. 01.12.1970*

104. What is your place of residence?
(1)__ Village
(2)__ Town below 20.000 inhabitants
(3)__ Town between 20.000 and 100.000 inhabitants
(4)__ City over 100.000 inhabitants

105. How many people are there in your household (including you)? …… people

106. How many children/adolescents are there in your household? ……people under 18 years old

107. How would you describe your financial situation?
(1)__ Below average
(2)__ Average
(3)__ Above average

108. How would you describe your household's overall situation?
Present 'Show card No. 5' to the respondent.
(1)__ We live very modestly – we do not have enough money for basic needs

(2)__ We live modestly – we have to be very careful with our daily budget
(3)__ We live normally - we have enough money for our daily needs, but we need to budget for bigger purchases
(4)__ We live relatively wealthy – we have enough money for our needs without particular budgeting
(5)__ We live very wealthy – we can afford some luxury

Question for adult respondents.

109. Do you work?
(1)__ No, I am retired or receiving a disability living allowance
(2)__ No, I am on maternity leave, I am unemployed or other (housewife/househusband)
(3)__ Yes, but it is only a temporary job
(4)__ Yes, I am permanently employed
(5)__ No, I study

Question for adult respondents – please end interview after this question.

110. What is you education?
(1)__ Primary
(2)__ Lower secondary
(3)__ Upper secondary
(4)__ Higher (e.g. BSc, MSc)

Question for respondents under 18 years old.

111. What is mother's (or legal guardian) education?
(1)__ Primary
(2)__ Lower secondary
(3)__ Upper secondary
(4)__ Higher (e.g. BSc, MSc)

Question for respondents under 18 years old.

112. What is father's (or legal guardian) education?
(1)__ Primary
(2)__ Lower secondary
(3)__ Upper secondary
(4)__ Higher (e.g. BSc, MSc)

READ OUT: Thank you very much for your time.

Show card No. 1

Food frequency consumption answer categories

(1) Never
(2) 1-3 times a month
(3) Once a week
(4) Few times a week
(5) Once a day
(6) Few times a day

Show card No. 2

How many hours a day (on average) do you spend watching TV or using a computer (including work)?

(1) Less than 2 hours
(2) From 2 to almost 4 hours
(3) From 4 to almost 6 hours
(4) From 6 to almost 8 hours
(5) From 8 to almost 10 hours
(6) More than 10 hours

Show card No. 3

Physical activity at work

Low	over 70% of time sedentary
Moderate	about 50% of time sedentary and 50% active
High	about 70% of time active or physical labour of high intensity

Show card No. 4

Physical activity during time off

Low	Mostly sedentary, watching TV, reading newspapers/book, light house works, walking for 1-2 hours a week
Moderate	Walking, cycling, exercise, gardening or other light intensity physical activity for 2-3 hours a week
High	Cycling, running, gardening or other sport activities that require physical activity for more than 3 hours a week

Show card No. 5

How would you describe your household's overall situation?

(1) We live very modestly – we do not have enough money for basic needs
(2) We live modestly – we have to be very careful with our daily budget
(3) We live normally - we have enough money for our daily needs, but we need to budget for bigger purchases
(4) We live relatively wealthy – we have enough money for our needs without particular budgeting
(5) We live very wealthy – we can afford some luxury

2. KomPAN® Dietary Habits and Nutrition Beliefs Questionnaire for adolescents aged 16-18 years and adults version 2.2. – self-administered questionnaire

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KomPAN® Dietary Habits and Nutrition Beliefs Questionnaire for adolescents aged 16-18 years and adults

version 2.2. self-administered questionnaire

Information in boxes are for the respondent
Additional instructions for the respondent in italics

We are conducting research, and we would like to learn about people's dietary habits and nutrition beliefs.
The data obtained will be anonymous and undisclosed and will be used only for the purpose of this research.
Thank you for your time and reliable answers.

Please read the questions and **mark one or more answers with the X**, according to the instructions, as shown in the example:

10. What types of food do you usually consume between the meals during the weekdays?
You can give **more than one** answer.
(10/1)_X_ Fruit
(10/2)__ Vegetables
(10/3)__ Unsweetened dairy beverages and desserts, e.g. yoghurts, curd/cream cheese, milk
(10/4)__ Sweetened dairy beverages and desserts, e.g. homogenised cheese, sweetened milk beverages, flavoured milk
(10/5)_X_ Sweet snacks, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, wafers
(10/6)__ Savoury snacks, e.g. crackers, pretzels, crisps, potato chips
(10/7)__ Nuts, almonds, seeds
(10/8)_X_ Other, please list …… sandwiches, fruit chips ……

1.**Respondent code** |__ | __ | __ | __ | 2. **Interviewer code** | __ | __ | 3**. Centre code** | __ | __ | Please do not enter

Date of the research: 4. **Day** | __ | __ | 5**. Month** | __ | __ | 6**. Year** |__ | __ | __ | __ | *enter e.g. 01.12.2014*

Part A. Dietary habits

We would like to ask you about your **dietary habits over the LAST YEAR**.

7. How many meals do you usually consume daily?
Please give **one** answer.
Meal - any of the regular occasions in a day when a reasonably large amount of food is eaten, e.g. morning, noon, evening.
(1)__ 1 meal
(2)__ 2 meals
(3)__ 3 meals
(4)__ 4 meals
(5)__ 5 meals or more

8. Do you consume meals at regular times?
Please give **one** answer.
(1)__ No
(2)__ Yes, but only some of them
(3)__ Yes, all of them

9. How often do you snack between the meals?
Please give **one** answer.
Snacking – usually a small portion of food eaten occasionally between the meals.

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

Question for people who snack between meals

10. What types of food do you usually consume between the meals during the weekdays?
You can give **more than one** answer.
(10/1)__ Fruit
(10/2)__ Vegetables
(10/3)__ Unsweetened dairy beverages and desserts, e.g. yoghurts, curd/cream cheese, milk
(10/4)__ Sweetened dairy beverages and desserts, e.g. homogenised cheese, sweetened milk beverages, flavoured milk
(10/5)__ Sweet snacks, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, wafers
(10/6)__ Savoury snacks, e.g. crackers, pretzels, crisps, potato chips
(10/7)__ Nuts, almonds, seeds
(10/8)__ Other, please list ……

11. What type of milk and dairy beverages you usually consume?
Please give **one** answer.
(1)__ Full fat
(2)__ Low fat
(3)__ No fat
(4)__ I don't consume it foods

12. How do you usually have your meat prepared?
You can give **more than one** answer.
(1)__ Boiled
(2)__ Stewed
(3)__ Grilled
(4)__ Roasted
(5)__ Fried
(6)__ I don't eat meat

13. What bread spread do you usually use?
Please give **one** answer.
(1)__ I don't use any spreads
(2)__ I use various spreads
(3)__ Mayonnaise
(4)__ Margarine
(5)__ Butter
(6)__ Spreadable butter (butter and margarine mix)
(7)__ Lard

14. What type of fat do you usually use for frying?
Please give **one** answer.
(1)__ I don't use any fats for frying
(2)__ I use various types of fats
(3)__ Vegetable oils (including olive oil)
(4)__ Margarine
(5)__ Butter
(6)__ Lard

15. Do you add any sugar to your hot beverages, e.g. tea, hot chocolate, coffee?
Please give **one** answer.
If your preferences vary depending on the type of the drink, please give answer related to the drink you drink most often

(1)__ No
(2)__ Yes, I add one teaspoon of sugar (or honey)
(3)__ Yes I add two or more teaspoons of sugar (or honey)
(4)__ Yes, I use sweeteners (low-caloric substitute for sugar)

16. Do you add salt to your meals and sandwiches once prepared?
Please give **one** answer.

(1)__ No
(2)__ Yes, but only sometimes
(3)__ Yes, I add salt to most of my meals

17. What type of water do you usually drink?
You can give **more than one** answer.

(1)__ I don't drink water
(2)__ Still water
(3)__ Sparkling water
(4)__ Flavoured water

Please think back about **ONE typical day** in terms of your diet in the **LAST WEEK** and answer the following questions.

18. What day of the week was it?

(1)__ Monday
(2)__ Tuesday
(3)__ Wednesday
(4)__ Thursday
(5)__ Friday
(6)__ Saturday
(7)__ Sunday

19. How many meals did you have that day? *Please give a number* …….. meals that day
***Meal** - any of the regular occasions in a day when a reasonably large amount of food is eaten, e.g. morning, noon, evening.*

20. How many times did you have fruit or vegetables that day? Please give a number……. times that day.
Please include fruit or vegetables consumed during meal times and when snacking.

21. Did you have any fast foods that day, e.g. potato chips, hamburgers, pizza, hot-dogs?

(1)__ No
(2)__ Yes. How many times? *Please give a number*…… times that day

Part B. Food frequency consumption

We would like to **ask you about the foods** you eat.

We would like to learn, **how often do you consume these types of foods**?

While answering to the questions, please consider foods eaten over **the LAST YEAR during your meals and snacking**, eaten at home and away.

In this part please give only **one** answer to each question.

22. How often do you eat white bread and bakery products, e.g. wheat bread, rye bread, wheat/rye bread, toast bread, bread rolls?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

23. How often to you eat wholemeal (brown) bread/bread rolls?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

24. How often do you have white rice, white pasta, fine-ground groats, e.g. semolina, couscous?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

25. How often do you eat buckwheat, oats, wholegrain pasta or other coarse-ground groats?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

26. How often do you eat fast foods, e.g. potato chips, hamburgers, pizza, hot-dogs?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

27. How often do you eat fried foods (e.g. meat or flour-based foods such as dumplings, pancakes etc.)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

28. How often do you use butter as a bread spread or as an addition to your meals/ for frying/ for baking etc.?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

29. How often do you use lard as a bread spread, or as an addition to you meals/ for frying/ for baking etc.?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

30. How often do you use vegetable oils or margarines or mixes of butter and margarines as a bread spread, or as an addition to your meals/ for frying/ for baking etc.?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

31. How often do you drink milk (including flavoured milk, hot chocolate, latte)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

32. How often do you eat fermented milk beverages, e.g. yoghurts, kefir (natural or flavoured)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

33. How often do you eat fresh cheese curd products, e.g. cottage cheese, homogenised cheese, fromage frais?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

34. How often do you eat cheese (including processed cheese, blue cheese)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

35. How often do you eat cold meats, smoked sausages, hot-dogs?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

36. How often do you eat red meat, e.g. pork, beef, veal, mutton, lamb, game?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

37. How often do you eat white meat, e.g. chicken, turkey, rabbit?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

38. How often do you eat fish?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

39. How often do you eat eggs?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

40. How often do you eat pulses-based foods, e.g. from beans, peas, soybeans, lentils?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

41. How often do you eat potatoes (excluding chips and crisps)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

42. How often do you eat fruit?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

43. How often do you eat vegetables?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

44. How often do you eat sweets, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, other?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

45. How often do you eat instant soups or ready-made soups, e.g. tinned, jar, concentrates (excluding frozen soup mixes)?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

46. How often do you eat tinned (jar) meats?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

47. How often do you eat tinned (jar) vegetables, e.g. pickles?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

48. How often do you drink fruit juices?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

49. How often do you drink vegetable juices or fruit and vegetable juices?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

50. How often do you drink sweetened hot beverages, such as black tea, coffee, herbal or fruit teas?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

51. How often do you drink sweetened carbonated or still beverages such as Coca-Cola, Pepsi, Sprite, Fanta, lemonade?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

52. How often do you drink energy drinks such as Red Bull, Monster, Rockstar or other?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

53. How often do you drink water, e.g. mineral, tap water?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

54. How often do you have alcoholic beverages?

(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

Part C. Nutrition beliefs

Below are statements regarding food and nutrition.

Please **provide your view regarding each of the statements**.

In this part you give **one** answer to each statement.

Statement	True (1)	False (2)	Unsure (3)
55. It is enough to eat wholegrains/cereals once a day.			
56. Only children and adolescents should drink milk.			
57. Fruit and/or vegetables should be consumed with every meal.			

Statement	True (1)	False (2)	Unsure (3)
58. Consumption of mouldy bread can result in food poisoning caused by *Salmonella.*			
59. High intakes of salt protect from hypertension.			
60. Limiting high-fat foods in everyday diet is protective against cardiovascular diseases.			
61. Frequent consumption of oily fish contributes to atherosclerosis.			
62. Frequent consumption of grilled meats contributes to the onset of cancer.			
63. Vegetarian diet increases the risk of anaemia.			
64. Bio-yoghurts contain beneficial gut bacteria.			
65. Vegetable oils and olive oil contain a high amount of cholesterol.			
66. Wholemeal bread have more fibre than white bread.			
67. Fruit and vegetables are a source of 'empty calories'.			
68. Butter and fortified margarines have high content of vitamin A and D.			
69. Cheese is a better source of calcium than cottage cheese.			
70. Offal has high amounts of 'bad' cholesterol - LDL.			
71. In a healthy diet, complex carbohydrates should be replaced with simple sugars.			
72. In a balanced diet, proteins should be the main source of energy.			
73. Inadequate intakes of vitamin PP can cause skin inflammation and diarrhoea.			
74. Sun exposure increases the synthesis of vitamin D in the human body.			
75. Phosphorus is a component of neural tissue.			
76. The ratio of calcium to phosphorus in a healthy diet should be 1:1.			
77. Consumption of fruit with high content of vitamin C increases bioavailability of iron.			
78. Starting cooking vegetables in cold water helps to preserve the nutrients.			
79. Sweets and animal fats are particularly high nutrient dense foods.			

Part D. Lifestyle and personal data

At the end, we would like to ask you questions referring to **your lifestyle** and **some personal data**.

If you feel that some of the questions are too personal, you can refuse to answer. We would be however grateful for every honest answer given.

In this part please give **one** answer to each question.

80. Are you currently following a diet?

(1)__ No
(2)__ Yes, as advised by my doctor for medical reasons
(3)__ Yes, it was my personal decision

Question to respondents who are following a diet.

81. Please provide the type of a diet ……

Question to respondents who are following a diet.

82. How long have you been following this diet?
Please specify the duration
*You can give **number of weeks** or **number of months** or **number of years**.*

Please provide a number of: ……. weeks, …… months, …… years.

83. How often do you eat out, e.g. in a bar, restaurant, café, canteen?
(1)__ Never
(2)__ 1-3 times a month
(3)__ Once a week
(4)__ Few times a week
(5)__ Once a day
(6)__ Few times a day

Question for respondents who drink alcoholic beverages.

84. What type of alcohol do you usually drink?
(1)__ Beer
(2)__ Wine
(3)__ Drinks
(4)__ Vodka

85. Do you currently smoke cigarettes, e-cigarettes, pipe or other tobacco?
(1)__ No
(2)__ Yes

86. Have you smoked cigarettes, e-cigarettes, pipe or tobacco in the past?
(1)__ No
(2)__ Yes

87. How many hours do you sleep a day during weekdays?
(1)__ 6 or less hours/day
(2)__ more than 6, but less than 9 hours/day
(3)__ 9 or more hours/day

88. How many hours do you sleep a day during the weekend?
(1)__ 6 or less hours/day
(2)__ more than 6, but less than 9 hours/day
(3)__ 9 or more hours/day

89. How many hours a day (on average) do you spend watching TV or using a computer (including work)?
(1)__ Less than 2 hours
(2)__ from 2 to almost 4 hours
(3)__ from 4 to almost 6 hours
(4)__ from 6 to almost 8 hours
(5)__ from 8 to almost 10 hours
(6)__ More than 10 hours

90. How would you describe your physical activity at work or at school?
(1)__ **Low:** more than 70% of time is sedentary
(2)__ **Moderate:** about 50% of time is sedentary and 50% active
(3)__ **High:** about 70% of time is active or physical labour of high intensity

91. How would you describe your physical activity during your time off?

(1)__ **Low:** mostly sedentary, watching TV, reading newspapers/books, light house works, walking for 1-2 hours/week
(2)__ **Moderate:** walking, cycling, exercise, gardening or other light physical activity for 2-3 hours/week
(3)__ **High:** cycling, running, gardening and other sport/recreational activities that require physical activity for longer than 3 hours/week

92. How would you describe your health status in comparison to other people your age?

(1)__ Worse than others
(2)__ The same as others
(3)__ Better than others

93. How would you describe your knowledge about nutrition?

(1)__ Insufficient
(2)__ Sufficient
(3)__ Good
(4)__ Very good

94. How would you describe your diet?

(1)__ Very bad
(2)__ Bad
(3)__ Good
(4)__ Very good

95. How would you describe your diet during the weekdays when compared to the weekend?

(1)__ No difference really
(2)__ Differs slightly
(3)__ Very different

96. How much do you weigh (kg)? |__ | __ | __ |, __ | kg

97. What is your height (cm)? |__ | __ | __ |, __ | cm

98. What is your waistline (cm)? |__ | __ | __ |, __ | cm
If you don't know, please provide your clothing size (waist measurement).
If feasible, waistline can be measured with measuring tape.

99. Sex:
(1)__ Male
(2)__ Female

100. The gender you identify with:
(1)__ The same
(2)__ Other

Date of birth: **101. Day** |__ | __ | **102. Month** |__ | __ | **103. Year** |__ | __ | __ | __ | *enter e.g. 01.12.1970*

104. What is your place of residence?
(1)__ Village
(2)__ Town below 20.000 inhabitants
(3)__ Town between 20.000 and 100.000 inhabitants
(4)__ City over 100.000 inhabitants

105. How many people are there in your household (including you)? …… people

106. How many children/adolescents are there in your household? ……people under 18 years old

107. How would you describe your financial situation?
(1)__ Below average
(2)__ Average
(3)__ Above average

108. How would you describe your household's overall situation?
(1)__ We live very modestly – we do not have enough money for basic needs
(2)__ We live modestly – we have to be very careful with our daily budget
(3)__ We live normally - we have enough money for our daily needs, but we need to budget for bigger purchases
(4)__ We live relatively wealthy – we have enough money for our needs without particular budgeting
(5)__ We live very wealthy – we can afford some luxury

Question for adult respondents.

109. Do you work?
(1)__ No, I am retired or receiving a disability living allowance
(2)__ No, I am on maternity leave, I am unemployed or other (housewife/househusband)
(3)__ Yes, but it is only a temporary job
(4)__ Yes, I am permanently employed
(5)__ No, I study

Question for adult respondents.

110. What is you education?
(1)__ Primary
(2)__ Lower secondary
(3)__ Upper secondary
(4)__ Higher (e.g. BSc, MSc)

Question for respondents under 18 years old.

111. What is mother's (or legal guardian) education?
(1)__ Primary
(2)__ Lower secondary
(3)__ Upper secondary
(4)__ Higher (e.g. BSc, MSc)

Question for respondents under 18 years old.

112. What is father's (or legal guardian) education?
(1)__ Primary
(2)__ Lower secondary
(3)__ Upper secondary
(4)__ Higher (e.g. BSc, MSc)

Thank you very much for your time.

3. The manual for developing of nutritional data from the KomPAN® questionnaire

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3.1. Introduction

KomPAN® questionnaire is an improved and expanded version of QEB questionnaire. KomPAN® has been developed in two versions, each with a different way of distribution – v.2.1 version administered by a well-trained researcher-interviewer (*i.e.* interviewer administered questionnaire), and v.2.2 version self-administered by the respondents. **Both versions of KomPAN® questionnaire v2.1 and v2.2 are consisting of the same questions, in the same order, and the way of developing nutritional data is the same.**

The purpose of this manual is to:

- support the less experienced researchers,
- consolidate the work of many researchers and development of nationwide standardization.

The experienced interviewers will have their own ways of analysing the data and will be able to provide new knowledge in this topic.

More information can be found in the "Methodological Guide to Nutrition Research" („Przewodnik metodyczny badań sposobu żywienia") by A. Gronowska-Senger in the chapter 4 titled "Principles for calculating and interpreting results" ("Zasady obliczania i interpretacji wyników") (Wadolowska 2013), as well as textbooks about statistical analysis.

Currently, the investigations concern the internal reliability (repeatability) of the KomPAN® questionnaire are provided. The results of this investigation are available at The Committee on the Science of Nutrition of the Polish Academy of Sciences (Komitet Nauki o Zywieniu Czlowieka Polskiej Akademii Nauk) website.

In multi-center studies, the internal reliability (repeatability) of the KomPAN® questionnaire was checked, and the results were published:

Kowalkowska et al. 2018. Reproducibility of a Questionnaire for Dietary Habits, Lifestyle and Nutrition Knowledge Assessment (KomPAN) in Polish Adolescents and Adults. Nutrients, 1; 10 (12): 1845, doi: 10.3390 / nu10121845.

3.2. General information

KomPAN® questionnaire consists of four parts, which have questions grouped by following topics:

A. Dietary habits,
B. Frequency of food consumption,
C. Nutrition beliefs,
D. Lifestyle and personal data.

The researcher can use any questions included in the questionnaire accordingly to the purpose of the research and own interests. It is recommended, however, using the entire set of questions from all parts of questionnaire. The researchers with reduced possibilities may use "the minimal set of questions", which will ensure the basic scope of assessment of dietary habits and the frequency of food consumption. The questions are presented below.

The minimal program of dietary data collection with the KomPAN® questionnaire:

Part A: the question concerning the number of meals during the day: (no. 7),

Part A: the confirmation questions (no. 18-21),

Part B: the questions concerning frequency of food consumption which are components of:

- Healthy Diet Index (23, 25, 31-33, 37, 38, 40, 42, 43),
- Unhealthy Diet Index (22, 24, 26-29, 34-36, 44, 46, 51, 52, 54),
- Overall Diet Quality Index (compilation of the Healthy Diet Index and Unhealthy Diet Index,

Part D: questions concerning lifestyle and respondent's personal data (all).

The complete set of questions from part A and B allows comprehensively characterize dietary habits and food frequency consumption of each respondent.

Part C contains statements about food and nutrition with a very variable level of difficulty. The use of all 25 questions from part C enables to differentiate respondents with unsatisfactory, satisfactory and good nutrition knowledge. It is not recommended to use only chosen statements from this part. The researchers, especially interested in the nutrition knowledge assessment, will find a wide set of questions in "Test assessment of the nutrition knowledge GAROTA" (“Test do sprawdzania i oceny wiedzy żywieniowej GAROTA”) (Gawecki et al 2012).

Part D concerns the lifestyle of respondents and their sociodemographic data. The data from this part can be used to characterize the respondents and adjust the nutritional variables in statistical analysis.

3.3. Data coding

It is necessary to code the respondents. The easiest way to code them is to assign them the numbers in the following order:

- by the number of carried out interviews (version v. 1.1 administered by the interviewer)
- by the number of filled out questionnaires (version v. 1.2 self-administered by the respondents).

Example 1

Respondent's code who was interviewed fortieth, will have the code 0040.

It is recommended to code (order numbers):

- the interviewer – this information can be used later on to review if the interviewer had any influence on the results,

- the center, where the interview was performed - it is useful information if the interviews are performed at multiple centers.

To make the data entry effective, it is needed to design a template in calculations sheet (for example Excel) or statistical program (examples: SPSS, Statistica) and to develop the coding system. This is especially required for the long text information (called etiquettes). The text information is coded by order numbers.

In questionnaire, where the questions have only one choice of the answer, the answers have assigned following code numbers: (1), (2), (3) etc. The template should include the code numbers instead the long text information.

In the case of questions with a possibility to mark one or more answers, each answer should constitute one new variable (creating new column in Excel sheet or Statistica software) with two choices of answers (NO=1, YES=2). Such construction has for example question number 10.

Example 2

In the question number 10 the respondent showed three categories of food consumed between meals.

10. What types of food do you usually consume between the meals during the weekdays?
You can give ***more than one*** *answer.*

(10/1)X__ Fruit
(10/2)__ Vegetables
(10/3)__ Unsweetened drinks and dairy products, e.g. yoghurts, curd/cream cheese, milk
(10/4)__ Sweetened drinks and dairy puddings, e.g. fromage frais cheese, sweetened milk drinks
(10/5)X__ Sweet snacks, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, wafers
(10/6)__ Salty snacks, e.g. crackers, pretzels, crisps, potato chips/French fries
(10/7)__ Nuts, almonds, seeds
(10/8)_X_ Other, please list .....sandwiches, fruit crisps.....

The answers should be coded by assigning number 1 to the answer NO and number 2 to the answer YES as following:

(10/1): code=2
(10/2): code=1
(10/3): code=1
(10/4): code =1
(10/5): code=2
(10/6): code= 1
(10/7): code=1
(10/8): code=2

Questions with the possibility of adding text information (half open) can be used to widen the answer sheet by the researcher, especially if the same answers repeat among the respondents or the research was done on the group which consumes similar food, for example vegetarians or athletes.

Example 3

In the question 10 the answer 10/8 may be transformed into two answers:

- 10/9 "sandwiches"
- 10/10 "fruit crisps".

3.4. Data verification

After coding the data, all variables (information) should be thoroughly checked in logical and systematic way in order to remove the mistakes. More information on this topic can be found in the chapter "The rules of calculation and interpretation the results" (Wadolowska 2013) and statistics handbooks.

The questions 18-21 from part A of the KomPAN® questionnaire (Dietary Habits) are "the check-up questions" and are meant to verify the answers given by the respondent concerning the usual number of meals eaten a day and usual frequency of consumption of selected products, which are usually overestimated (fruits, vegetables) or underestimated (fast food). This is why it is always needed to:

- ask the question 18 and 19 if the question number 7 is used (number of meals during the day),
- ask the question 18 and 20 if the questions number 42 and 43 are used (fruits, vegetables),
- ask the question 18 and 21 if the question number 26 is used (fast food).

Attention: During the interview, the interviewer cannot remind the respondent what were the answers to the linked questions (essential and verifying), because the idea of verifying the answers reliability will lose its purpose.

3.4.1. Verification of meal numbers

The table 1 presents verification scheme for the answer to question 7 concerning the number of meals usually consumed during the day (given by the respondent).

Table 1. Evaluation of the answers reliability concerning the numbers of meals usually consumed during the day (question no. 7)

	Question no. 19 (verifying): The number of meals in the typical day during last week				
Question no. 7: Usual number of meals usually consumed during the day	1	2	3	4	5 or more
1	■	▒			
2	▒	■	▒		
3		▒	■	▒	
4			▒	■	▒
5 or more				▒	■

Explanations: ■ Answers are compatible ▒ Answers are relatively compatible □ Answers are not compatible

Compatibility of the answers to the questions no. 7 and no. 19 (verifying) can be interpreted as follows:

- the respondent has well established dietary habits,
- the respondent gave a reliable dietary interview and the information on dietary habits collected in part A can be interpreted with great confidence.

Recommended decision of the researcher: the respondent should remain in the database with great certainty and should be included in the analysis of the results.

The relative compatibility of the answers to the questions no. 7 and no. 19 can be interpreted as following:

- the respondent does not have well established dietary habits or the last week was less typical for his usual dietary habits,
- the respondent gave a relatively reliable dietary interview and the information on dietary habits collected in part A can be interpreted with the limited confidence.

The researcher can make three alternative decisions:

1. leave the respondent in database and include in the result analysis with the respondents who provided compatible answers,

2. leave the respondent in database and make a separate result analysis for respondents with "relatively compatible" answers and "compatible" answers,
3. exclude the respondent from the database.

The recommended researcher's decision is option 2: leave the respondent in database and make a separate result analysis.

No compatibility in answering questions no. 7 and no. 19 can be interpreted as follows:

- the respondent does not have established dietary habits and his dietary habits are characterised by the high variability (day-to-day) or the last week was not typical for the respondent,
- the respondent gave an unreliable dietary interview and the dietary information collected in part A can be interpreted with small confidence.

The researcher can make two alternative decisions:

1. leave the respondent in the database, but the data analysis performed separately for the "no compatible", "relatively compatible" and "compatible" answers,
2. remove the respondent from the database.

In the case of lack of compatibility, there is no decision, which may be clearly recommended to the researcher as the one the best. Every decision about the exclusion the respondent from the database should be thoroughly discussed with other experienced researchers and individually made for each respondent (case).

3.4.2. Verification of the frequency consumption of fruit, vegetable and fast foods

To evaluate the reliability of the answers to questions no. 42 and 43 concerning usual frequency of fruit and vegetable consumption, it is needed to calculate the total usual frequency of fruit and vegetable consumption expressed as times/day, according to the following scheme:

Total usual frequency of fruit and vegetable consumption (times/day) =
0xcat(1)F + 0.06xcat(2)F + 0.14xcat(3)F + 0.5xcat(4)F + 1xcat(5)F + 2xcat(6)F + 0xcat(1)V +
0.06xcat(2)V + 0.14xcat(3)V + 0.5xcat(4)V + 1xcat(5)V + 2xcat(6)V

Legend: cat(no.) F – following categories of fruit frequency consumption
cat(no.) V – following categories of vegetable frequency consumption

The table 2 represents verification scheme for the answer to question 42 and 43 concerning usual frequency of fruit and vegetable consumption.

Table 2. The evaluation of answers reliability concerning the usual frequency consumption of fruit and vegetables (questions no. 42 and 43)

	Question no. 20 (verifying): The frequency of fruit and vegetables consumption on a typical day last week		
Questions no. 42 and 43: Usual frequency consumption of fruit and vegetables (times/day)	Not once	Once	Twice or more
0-0.50	■	▒	
0.51-1.50	▒	■	▒
1.51-4.00		▒	■

Explanations: ■ Answers are compatible ▒ Answers are relatively compatible □ Answers are not compatible

Compatibility of the answers to the questions no. 42 and 43 with no. 20 (verifying) can be interpreted as follows:

- the respondent has well established dietary habits,
- the respondent gave a reliable dietary interview and information concerning food frequency consumption collected in the part B can be interpreted with great confidence, especially regarding foods with a beneficial effect on health.

Recommended decision of the researcher: the respondent should remain in the database with great certainty and should be included in the analysis of the results.

The relative compatibility of the answers to the questions no. 42, 43 and no. 20 can be interpreted as follows:

- the respondent does not have well established dietary habits or the last week was less typical for his usual dietary habits,
- the respondent gave a relatively reliable dietary interview and the information on the frequency of food consumption collected in part B can be interpreted with the limited confidence, especially regarding foods with the beneficial effect on health.

The researcher can make three alternative decisions:

1. leave the respondent in database and include in the results analysis with the respondents who provided compatible answers,
2. leave the respondent in database and make a separate results analysis for respondents with "relatively compatible" answers and "compatible" answers,
3. exclude the respondent from the database.

The recommended researcher's decision is option 2: leave the respondent in database and make a separate results analysis for respondents with relatively compatible answers and compatible answers.

No compatibility in answering questions no. 42, 43 and 20 can be interpreted as follows:

- the respondent does not have established dietary habits and his dietary habits are characterised by the high variability (day-to-day) or the last week was not typical for the respondent,
- the respondent gave unreliable dietary interview and the information on the frequency of food consumption collected in part B can be interpreted with small confidence, especially regarding foods with the beneficial effect on health.

The researcher can make two alternative decisions:

1. leave the respondent in the database, but the data analysis performed separately for the "no compatible", "relatively compatible" and "compatible" answers,
2. remove the respondent from the database.

In the case of lack of compatibility, there is no decision, which may be clearly recommended to the researcher as the one work scheme. Every decision about the exclusion the respondent from the database should be thoroughly discussed with other experienced researchers and individually made for each respondent (case).

Example 4

The respondent answered the question no. 42 concerning usual fruit frequency consumption gave the answer (5) – "Once a day", and to the question 43 concerning usual frequency of vegetables consumption gave answer (6) – "Few times a day".

In the verifying question no. 20, the respondent gave the answer "2 times/day".

*Result: The total sum of usual frequency of consumption of fruit and vegetables (times/day) = 1+2=**3 times/day** (included in the range: 1.51-4.00) and according to the scheme in table 2, it is consistent with the answer to the verifying question **(2 times/day)**.*

***Interpretation**: The respondent answered reliably defined usual frequency of consumption of fruit and vegetables.*

The table 3 presents the verification scheme of answers given by the respondent to the question no. 26 concerning the usual frequency of consumption of fast foods.

Table 3. The evaluation of answers reliability concerning the usual frequency of consumption of fast food (questions no. 26)

	Question no. 21 (verifying): The frequency of consumption of fast foods in the typical day during last week		
Question no. 26: Usual frequency of consumption of fast foods	Not once	Once	Twice or more
Never			
1-3 times a month			
Once a week			
Few times a week			
Once a day			
Few times a day			

Explanations: Answers are compatible; Answers are relatively compatible; Answers are not compatible

Compatibility of the answers to the question no. 26 with no. 21 (verifying) can be interpreted as follows:

- the respondent has well established dietary habits,
- the respondent gave a reliable dietary interview and information concerning food frequency consumption collected in the part B can be interpreted with great confidence, especially regarding foods with a not beneficial effect on health.

Recommended decision of the researcher: the respondent should remain in the database with great certainty and should be included in the analysis of the results.

The relative compatibility of the answers to the questions no. 26 and no. 21 can be interpreted as follows:

- the respondent does not have well established dietary habits or the last week was less typical for his usual dietary habits,
- the respondent gave a relatively reliable dietary interview and the information on the frequency of food consumption collected in part B can be interpreted with the limited confidence, especially regarding foods with a not beneficial effect on health.

The researcher can make three alternative decisions:

1. leave the respondent in database and include in the results analysis with the respondents who provided compatible answers,
2. leave the respondent in database and make a separate results analysis for respondents with "relatively compatible" answers and "compatible" answers,
3. exclude the respondent from the database.

The recommended researcher's decision is option 2: leave the respondent in database and make a separate results analysis for respondents with relatively compatible answers and compatible answers.

No compatibility in answering questions no. 26 and 21 can be interpreted as the following:

- the respondent does not have established dietary habits and his nutrition is characterised by the high variability (day-to-day) or the last week was not typical for the respondent,
- the respondent gave unreliable dietary interview and the information on the frequency of food consumption collected in part B can be interpreted with small confidence, especially regarding foods with a not beneficial effect on health.

The researcher can make two alternative decisions:

1. leave the respondent in the database, but the data analysis performed separately for the "no compatible", "relatively compatible" and "compatible" answers,
2. remove the respondent from the database.

In the case of lack of compatibility, there is no decision, which may be clearly recommended to the researcher as the one work scheme. Every decision about the exclusion the respondent from the database should be thoroughly discussed with other experienced researchers and individually made for each respondent (case).

3.4.3. Reliability of the respondent – initial evaluation

Initial evaluation of respondent's reliability should proceed the system evaluation, performed according to particular rules described in the chapter 3.4.4.

The initial evaluation of respondent's reliability comes down to general and logical analysis of the answers given by the respondent. During the interview the interviewer- researcher has a possibility to observe the behaviour of the respondent and evaluate her involvement in the answering the questions. This evaluation is subjective, however, it can be conclusive in the case, when there are existing other problems, such as lack of multiple answers. Lack of answers to multiple questions is the main criterion of initial evaluation respondent's reliability in the case of self-administered questionnaire.

The recommended decisions concerning initial evaluation of respondent's reliability are shown in the table 4.

Table 4. The recommended decisions concerning initial evaluation of respondent's reliability

Criteria of the initial analysis of respondent's reliability	The decision concerning the respondent	Decision justification
In the part A: • missing the answers to the verifying questions (no. 18-21)	Remove the respondent from database	• Impossible to verify the reliability of the respondent
In the part B-alternative: • missing the answers to the questions needed to calculate the diet indexes (no. 23, 25, 31-33, 37, 38, 40, 42, 43, 22, 24, 26-29, 34-36, 44, 46, 51, 52, 54 • missing many answers	Remove the respondent from database	• Impossible to characterise the nutrition of the respondent
In the part C: • in at least 15 statements (60%) on the topic food and nutrition (no. 55-79) the respondent answered "hard to tell"	Alternative: • leave the respondent in the database and interpret the results with the limited confidence (recommended decision) • exclude the respondent from the analysis concerning knowledge on food and nutrition	• Respondent is unsure of his nutrition knowledge and /or not enough involved
In the part D: Personal data missing, for example: • dates of birth (no. 100-102) • dates of the interview (no. 4-6) • gender (no. 99) • place of living (no.103) • education (no. 109-111)	Remove the respondent from database	• Impossible to classify the respondent into the population group
In the part D: • missing much more answers then the ones shown above	Alternative: • exclude the respondent from database – recommended decision, • leave the respondent in database and interpret the results with limited confidence	• Significant restriction in respondent characterisation
During the interview given by the interviewer: • visible reluctance of the respondent to give the answer, • the respondent gives the answer without a time to reflection. Comment: the conclusive criteria if there are other problems, for example missing many answers.	Remove the respondent from database	• Respondent little involved and/or not cooperating, what is undermining the reliability of the answers in the questionnaire

3.4.4. System evaluation of reliability of respondent

After verifying the answers provided by the respondent in reference to three dietary characteristics, *i.e*. the usual number of meals consumed a day (question no.7), and usual frequency consumption of fruit and vegetables (no. 42 and 43), and fast foods (no. 26), it is needed to make the final decision concerning the reliability of the respondent. The recommendations are presented in table 5.

Table 5. Recommended decisions concerning the evaluation of respondent's reliability on the basis of evaluation of reliability of three dietary characteristics* (questions no. 7, 26, 42, 43)

The results of answers compatibility	Decision concerning the respondent
Answer compatibility for all 3 characteristics of nutrition	Leave the respondent in the database.
No compatibility between all 3 characteristics of nutrition	Exclude the respondent in the database.
Other cases	Alternatively: • leave the respondent in the database and interpret the results with the limited confidence, • leave the respondent in the database, but the data analysis perform separately for respondents with variable level of answer compatibility.

*The characteristics of nutrition include: number of meals (question no. 7), frequency consumption of fruit and vegetables (questions no. 42 and 43), and fast foods (question no. 26)

3.5. Data conversion

3.5.1. Part A. Dietary habits

Data in this part have qualitative characteristics. Most of the questions have set a of answers consisting of the many categories, which can be converted into a smaller number of new, more integrated categories (table 6).

Table 6. Example of new category grouping in question no. 9

Frequency consumption categories	New categories of frequency consumption (I)	New categories of frequency consumption (II)
Never	Less often than once a week	Less often than once a day
1-3 times a month		
Once a week	At least once a week	
Few times a week		
Once a day		At least once a day
Few times a day		

The questions, in which the interpreter is able to mark more than one answer (for example no. 10) can be used to make a hierarchal list. The percentage of respondents calculated for each category should be lined-up in decreasing/increasing order showing the most and least typical dietary habits. In the questions with multiple answers to choose from, the percentage of the respondents in all the categories does not sum up to 100% (can be higher).

Example 5

Table 7. The hierarchal list of food consumed between meals in the decreasing order based on the answers given by the respondents

Food consumed between meals	*% of respondents**
Fruit	*95*
Sweet snacks, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, wafers	*77*
Salty snacks, e.g. crackers, pretzels, crisps, potato chips/French fries	*54*
Sweetened drinks and dairy puddings, e.g. fromage frais cheese, sweetened milk drinks, flavoured milk	*35*
Other products	*28*
Unsweetened drinks and dairy products, e.g. yoghurts, curd/cream cheese, milk	*22*
Nuts, almonds, seeds	*16*
Vegetables	*9*

** The respondents could give multiple answers*

3.5.2. Part B. Frequency of food consumption

3.5.2.1. Basic rules of data conversion

Data in this part have a form of qualitative data, and the questions are "questions-range" with increasing frequency of food consumption from "never" to "few times a day". Six original categories of frequency of food consumption can be converted:

- into other categories by connecting them together, analogically as the case in table 6,
- into the "semiquantitative" data, which logically reflect the increasing characteristics (table 6) by using:
  - scoring, *i.e*. assigning to the categories of frequency of food consumption the integers,
  - converting into real numbers and expressing the frequency of food consumption by times/day.

The converted categories can be analysed the same way as the real numerical data, however, such data will not have a normal distribution. This requires using nonparametric tests or logarithm the data in the statistical analysis (Wadolowska 2013).

To standardise the way of analysis and interpreting the results, it is recommended to use scores and/or indicators of daily frequency expressed as times/day according to the example in table 8.

Table 8. Recommended scoring system for frequency of food consumption in KomPAN® questionnaire

Frequency of food consumption categories	Scoring for the frequency categories	Daily frequency (times/day)
Never	1	0
1-3 times a month	2	0.06
Once a week	3	0.14
Few times a week	4	0.5
Once a day	5	1
Few times a day	6	2

3.5.2.2. Diet quality indexes

In order to comprehensively evaluate the diet quality, on the basis of literature review (Brennan et al. 2010, Hu 2002, Kant and Graubard 2005, Kant 2010, Waijers et al. 2007, Wirfalt et al 2013, Wirt and Collins 2009), three indexes have been proposed:

- "Pro-Healthy Diet Index" (pHDI-10, *Prohealthy-Diet-Index-10* or pHDI, *Prohealthy-Diet-Index*) – this index involves 10 food groups with a potentially beneficial influence on health,
- "Non-Healthy Diet Index" (nHDI-14, *Non-Healthy-Diet-Index-14* or nHDI, *Non-Healthy-Diet-Index*) – this index involves 14 food groups with a potentially negative influence on health,
- "Diet-Quality Index" (DQI) – this index involves 24 food groups, including 10 food groups with a potentially beneficial influence on health and 14 food groups with a potentially negative influence on health.

It should be noted that the diet quality indexes (diet quality scores) are the predefined dietary patterns (hypothesis-driven dietary patterns), so they describe a set of common dietary characteristics selected on the basis of available scientific evidence. Dietary quality scores can be calculated and interpreted alternatively or concurrently with dietary patterns that have been identified using advanced statistical methods (data-driven dietary patterns).

The indexes have been calculated by summing of frequency of food consumption (times/day) of indicated 10 (pHDI) or 14 food groups (nHDI) or 24 food groups (DQI) (tables 9, 10, 11). The experienced researchers can modify the structure of indexes according to their own knowledge and science-based evidence.

Table 9. List of components of "Pro-Healthy Diet Index" (pHDI) with a potentially beneficial influence on health in the KomPAN® questionnaire

Question no.	"Pro-Healthy Diet Index" (pHDI) and its components in KomPAN® questionnaire
23	wholemeal (brown) bread/bread rolls
25	buckwheat, oats, wholegrain pasta or other coarse-ground groats
31	milk (including flavoured milk, hot chocolate, latte)
32	fermented milk drinks, e.g. yoghurts, kefir (natural or flavoured)
33	fresh cheese curd products, e.g. cottage cheese, cream cheese, cheese-based puddings
37	white meat, e.g. chicken, turkey, rabbit
38	fish
40	legumes-based foods, e.g. beans, peas, soybeans, lentils
42	fruit
43	vegetables
pHDI-10 = the sum of frequency of 10 food groups consumption (times/day; pHDI range 0-20)	

Table 10. List of components of "Non-Healthy Diet Index" (nHDI) with a potentially negative influence on health in the KomPAN® questionnaire

Question no.	"Non-Healthy Diet Index" (nHDI) and its components in KomPAN® questionnaire
22	white bread and bakery products, e.g. wheat bread, rye bread, wheat-rye bread, toast bread, bread rolls
24	white rice, white pasta, fine-ground groats, e.g. semolina, couscous
26	fast foods, e.g. potato chips/French fries, hamburgers, pizza, hot-dogs
27	fried foods (e.g. meat or flour-based foods such as dumplings, pancakes etc.)
28	butter as a bread spread or as an addition to your meals/ for frying/ for baking etc.
29	lard as a bread spread, or as an addition to you meals/ for frying/ for baking etc.

34	cheese (including processed cheese, blue cheese)
35	cured meat, smoked sausages, hot-dogs
36	red meat, e.g. pork, beef, veal, lamb, game
44	sweets, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, other
46	tinned (jar) meats
51	sweetened carbonated or still drinks such as Coca-Cola, Pepsi, Sprite, Fanta, lemonade
52	energy drinks such as Red Bull, Monster, Rockstar or other
54	alcoholic beverages
nHDI-14 = the sum of frequency of 14 food groups consumption (times/day; nHDI range 0-28)	

In order to standardise the range of both indexes (pHDI and nHDI) and simplifying its interpretation, it is recommended to calculate the sum of frequency of food consumption (times/day) and its expression in scale from 0 to 100 points.

"Pro-Healthy Diet Index" (pHDI, in points) = (100/20) x the sum of frequency of 10 food groups consumption (times/day)

"Non-Healthy Diet Index" (nHDI, in points) = (100/28) x the sum of frequency of 14 food groups consumption (times/day)

The overall Diet Quality Index was calculated as the sum of all positive components of the pHDI and all negative components of the nHDI. In the calculations, weight scores (so-called weights) were used, thus allows the share of 10 components of the pHDI is the same as the share of 14 components of the nHDI (table 11). The range of the DQI is from 100 to 100 points.

"Diet Quality Index" (DQI, in points) = (100/20) x the sum of frequency of 10 food groups consumption (times/day) + (-100/28) × the sum of frequency of 14 food groups consumption (times/day)

Table 11. List of components of "Diet Quality Index" (DQI) with a potentially beneficial and negative influence on health in the KomPAN® questionnaire

Question no.	„Diet Quality Index" (DQI) and its components in KomPAN® questionnaire	Weight scores
	Positive components	
23	wholemeal (brown) bread/bread rolls	100/20
25	buckwheat, oats, wholegrain pasta or other coarse-ground groats	100/20
31	milk (including flavoured milk, hot chocolate, latte)	100/20
32	fermented milk drinks, e.g. yoghurts, kefir (natural or flavoured)	100/20
33	fresh cheese curd products, e.g. cottage cheese, cream cheese, cheese-based puddings	100/20
37	white meat, e.g. chicken, turkey, rabbit	100/20
38	fish	100/20
40	legumes-based foods, e.g. beans, peas, soybeans, lentils	100/20
42	fruit	100/20
43	vegetables	100/20
	Negative components	
22	white bread and bakery products, e.g. wheat bread, rye bread, wheat-rye bread, toast bread, bread rolls	-100/28
24	white rice, white pasta, fine-ground groats, e.g. semolina, couscous	-100/28

26	fast foods, e.g. potato chips/French fries, hamburgers, pizza, hot-dogs	-100/28
27	fried foods (e.g. meat or flour-based foods such as dumplings, pancakes etc.)	-100/28
28	butter as a bread spread or as an addition to your meals/ for frying/ for baking etc.	-100/28
29	lard as a bread spread, or as an addition to you meals/ for frying/ for baking etc.	-100/28
34	cheese (including processed cheese, blue cheese)	-100/28
35	cured meat, smoked sausages, hot-dogs	-100/28
36	red meat, e.g. pork, beef, veal, lamb, game	-100/28
44	sweets, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, other	-100/28
46	tinned (jar) meats	-100/28
51	sweetened carbonated or still drinks such as Coca-Cola, Pepsi, Sprite, Fanta, lemonade	-100/28
52	energy drinks such as Red Bull, Monster, Rockstar or other	-100/28
54	alcoholic beverages	-100/28
DQI = the sum of products of frequency of 24 food groups consumption (times/day) and weight scores (points; DQI range: -100 – 100)		

The interpretation of the pHDI, nHDI and DQI is intuitive:

- the higher value of the pHDI or DQI indicates the higher quality of diet, and the higher intensity of beneficial dietary characteristics for health,
- the higher value of the nHDI indicates the worse quality of diet, and the higher intensity of harmful dietary characteristics for health.

The idea of interpreting of the pHDI and nHDI is the same for indexes expressed as cumulative times/day or in points. The proposed example of indexes interpretation is presented in tables 12 and 13a-c.

Table 12. The proposed way of interpreting the "Pro-Healthy Diet Index" (pHDI) and "Non-Healthy Diet Index" (nHDI) for KomPAN® questionnaire

Intensity of dietary characteristics (diet adherence to the index)	Range (times/day)		Range (in points)	
	"Pro-Healthy Diet Index" pHDI	"Non-Healthy Diet Index" nHDI	"Pro-Healthy Diet Index" pHDI	"Non-Healthy Diet Index" nHDI
Low	0-6.66	0-9.33	0-33	0-33
Medium	6.67-13.33	9.34-18.66	34-66	34-66
High	13.34-20	18.67-28	67-100	67-100

Table 13a. The proposed way of scientific interpretation the "Diet Quality Index" (DQI) for KomPAN® questionnaire divided into 3 categories

Range of DQI (in points)	Intensity of dietary characteristics	Interpretation
-100 – -26	High intensity of non-healthy dietary characteristics	The frequency of consumption of foods with a potentially negative influence on health is higher than the frequency of consumption of foods with a potentially beneficial influence on health. Thus, a harmful effect of diet on health is predicted.
-25 – 25	Low intensity of non-healthy and prohealthy dietary characteristics	The frequency of consumption of foods with a potentially negative influence on health is similar to the frequency of consumption of foods with a potentially beneficial influence on health. Thus, a neutral effect of diet on health is predicted.
26 – 100	High intensity of prohealthy dietary characteristics	The frequency of consumption of foods with a potentially beneficial influence on health is higher than the frequency of consumption of foods with a potentially negative influence on health. Thus, a beneficial effect of diet on health is predicted.

Table 13b. The proposed way of scientific interpretation the "Diet Quality Index" (DQI) for KomPAN® questionnaire divided into 5 categories

Range of DQI (in points)	Intensity of dietary characteristics	Interpretation
-100 – -80	High intensity of non-healthy dietary characteristics	The frequency of consumption of foods with a potentially negative influence on health is much higher than the frequency of consumption of foods with a potentially beneficial influence on health. Thus, a harmful effect of diet on health is predicted.
-79 – -26	Moderate intensity of non-healthy dietary characteristics	The frequency of consumption of foods with a potentially negative influence on health is higher than the frequency of consumption of foods with a potentially beneficial influence on health. Thus, a slightly harmful effect of diet on health is predicted.
-25 – 25	Low intensity of non-healthy and prohealthy dietary characteristics	The frequency of consumption of foods with a potentially negative influence on health is similar to the frequency of consumption of foods with a potentially beneficial influence on health. Thus, a neutral effect of diet on health is predicted.
26 – 79	Moderate intensity of prohealthy dietary characteristics	The frequency of consumption of foods with a potentially beneficial influence on health is higher than the frequency of consumption of foods with a potentially negative influence on health. Thus, a slightly beneficial effect of diet on health is predicted.
80 – 100	High intensity of prohealthy dietary characteristics	The frequency of consumption of foods with a potentially beneficial influence on health is much higher than the frequency of consumption of foods with a potentially negative influence on health. Thus, a beneficial effect of diet on health is predicted.

Table 13c. The proposed way of popularized interpretation the "Diet Quality Index" (DQI) for KomPAN® questionnaire divided into 5 categories, intended for individual users

Range of DQI (in points)	Simplified interpretation for the individual user	Extended interpretation for the individual user
-100 – -80	It's bad! It is necessary to improve your diet!	You eat very often foods that are bad for your health. and You eat very rarely foods that are good for your health.
-79 – -26	It's not good! Improve your diet!	You eat too often foods that are bad for your health. and You eat too rarely foods that are good for your health.
-25 – 25	Your diet is neither bad nor good. Make it better!	You rarely eat foods that are bad for your health. and You eat too rarely foods that are good for your health.
26 – 79	It's good! But it's worth improving your diet!	You often eat foods that are good for your health. and You rarely eat foods that are bad for your health.
80 – 100	It's great! Keep it up!	You eat very often foods that are good for your health. and You eat very rarely foods that are bad for your health.

Example 6
In the questions concerning frequency of food consumption, the respondent showed the answers, which are shown in the tables 14, 15 and 16, and the calculations and interpretation of the results are presented below the tables.

Table 14. The frequency of food consumption with a potentially beneficial influence on health indicated by the respondent in the KomPAN® questionnaire

Question no.	*"Pro-Healthy Diet Index" and its components*	*Chosen category of food frequency consumption*	*Daily frequency (times/day)*
23	*wholemeal (brown) bread/bread rolls*	*Once a week*	*0.14*
25	*buckwheat, oats, wholegrain pasta or other coarse-ground groats*	*Never*	*0*
31	*milk (including flavoured milk, hot chocolate, latte*	*Few times a week*	*0.5*
32	*fermented milk drinks, e.g. yoghurts, kefir (natural or flavoured)*	*1-3 times a month*	*0.06*
33	*fresh cheese curd products, e.g. cottage cheese, cream cheese, cheese-based puddings*	*1-3 times a month*	*0.06*
37	*white meat, e.g. chicken, turkey, rabbit*	*Few times a week*	*0.5*
38	*fish*	*Once a week*	*0.14*
40	*legumes-based foods, e.g. beans, peas, soybeans, lentils*	*Never*	*0*
42	*fruit*	*Few times a day*	*2*
43	*vegetables*	*Once a day*	*1*
***The sum of frequency of 10 food groups consumption** (times/day)*			***4.4***

"Pro-healthy Diet Index" = (100/20)x the sum of frequency of 10 food groups consumption (times/day)
"Pro-Healthy Diet Index" = (100/20)x 4.4 = 22 points (the amount is in range of 0-33 points)
or "Pro-Healthy Diet Index" = 4.4 times/day (the amount is in range of 0-6.66 times/day)

Result: Diet with low intensity of pro-healthy characteristics.

***Interpretation**: The respondent's diet is in low adherence to a healthy dietary pattern. Thus, it is recommended to significantly increase the frequency of consumption of food with a potentially beneficial influence on health.*

Table 15. The frequency of food consumption with a potentially negative influence on health indicated by the respondent in the KomPAN® questionnaire

Question no.	"Non-Healthy Diet Index" and its components	Chosen category of food frequency consumption	Daily frequency (times/day)
22	white bread and bakery products, e.g. wheat bread, rye bread, wheat-rye bread, toast bread, bread rolls	Few times a day	2
24	white rice, white pasta, fine-ground groats, e.g. semolina, couscous	Few times a week	0.5
26	fast foods, e.g. potato chips/French fries, hamburgers, pizza, hot-dogs	Once a week	0.14
27	fried foods (e.g. meat or flour-based foods such as dumplings, pancakes etc.)	Once a day	1
28	butter as a bread spread or as an addition to your meals/ for frying/ for baking etc.	Few times a day	2
29	lard as a bread spread, or as an addition to you meals/ for frying/ for baking etc.	1-3 times a month	0.06
34	cheese (including processed cheese, blue cheese)	Few times a week	0.5
35	cured meat, smoked sausages, hot-dogs	Once a day	1
36	red meat, e.g. pork, beef, veal, lamb, game	Few times a week	0.5
44	sweets, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, other	Few times a day	2
46	tinned (jar) meats	1-3 times a month	0.06
51	sweetened carbonated or still drinks such as Coca-Cola, Pepsi, Sprite, Fanta, lemonade	Few times a week	0.5
52	energy drinks such as Red Bull, Monster, Rockstar or other	Never	0
54	alcoholic beverages	Few times a week	0.5
The sum of frequency of 14 food groups *consumption (times/day)*			***10.76***

"Non-healthy Diet Index" = (100/28) x the sum of frequency of 14 food groups consumption (times/day)

"Non-Healthy Diet Index" = (100/28) x 10.76 = 38.4 points (the amount is in range of 34-66 points)

or "Non-Healthy Diet Index" = 10.76 times/day (the amount is in range of 9.34-18.66 times/day)

Result: Diet with medium intensity of non-healthy characteristics.

Interpretation: *The respondent's diet is in moderate adherence to an unhealthy dietary pattern. Thus, it is recommended to significantly decrease the frequency of consumption of food with a potentially negative influence on health.*

Table 16. The frequency of food consumption with a potentially beneficial and with a potentially negative influence on health indicated by the respondent in the KomPAN® questionnaire

Question no.	"Diet Quality Index" and its components	Chosen category of food frequency consumption	Daily frequency (times/day)
	Positive components		
23	wholemeal (brown) bread/bread rolls	Once a week	0.14
25	buckwheat, oats, wholegrain pasta or other coarse-ground groats	Never	0
31	milk (including flavoured milk, hot chocolate, latte)	Few times a week	0.5
32	fermented milk drinks, e.g. yoghurts, kefir (natural or flavoured)	1-3 times a month	0.06
33	fresh cheese curd products, e.g. cottage cheese, cream cheese, cheese-based puddings	1-3 times a month	0.06
37	white meat, e.g. chicken, turkey, rabbit	Few times a week	0.5
38	fish	Once a week	0.14
40	legumes-based foods, e.g. beans, peas, soybeans, lentils	Never	0

42	*fruit*	*Few times a day*	*2*
43	*vegetables*	*Once a day*	*1*
***The sum of frequency of 10 food groups consumption – positive components** (times/day)*			***4.4***
	Negative components		
22	*white bread and bakery products, e.g. wheat bread, rye bread, wheat-rye bread, toast bread, bread rolls*	*Few times a day*	*2*
24	*white rice, white pasta, fine-ground groats, e.g. semolina, couscous*	*Few times a week*	*0.5*
26	*fast foods, e.g. potato chips/French fries, hamburgers, pizza, hot-dogs*	*Once a week*	*0.14*
27	*fried foods (e.g. meat or flour-based foods such as dumplings, pancakes etc.)*	*Once a day*	*1*
28	*butter as a bread spread or as an addition to your meals/ for frying/ for baking etc.*	*Few times a day*	*2*
29	*lard as a bread spread, or as an addition to you meals/ for frying/ for baking etc.*	*1-3 times a month*	*0.06*
34	*cheese (including processed cheese, blue cheese)*	*Few times a week*	*0.5*
35	*cured meat, smoked sausages, hot-dogs*	*Once a day*	*1*
36	*red meat, e.g. pork, beef, veal, lamb, game*	*Few times a week*	*0.5*
44	*sweets, e.g. confectionary, biscuits, cakes, chocolate bars, cereal bars, other*	*Few times a day*	*2*
46	*tinned (jar) meats*	*1-3 times a month*	*0.06*
51	*sweetened carbonated or still drinks such as Coca-Cola, Pepsi, Sprite, Fanta, lemonade*	*Few times a week*	*0.5*
52	*energy drinks such as Red Bull, Monster, Rockstar or other*	*Never*	*0*
54	*alcoholic beverages*	*Few times a week*	*0.5*
***The sum of frequency of 14 food groups consumption – negative components** (times/day)*			***-10.76***

"Diet Quality Index" = (100/20) x the sum of frequency of 10 food groups consumption (times/day) + (-100/28) × the sum of frequency of 14 food groups consumption (times/day) (DQI range: -100 - 100 points)

"Diet Quality Index" = (100/20) × 4,4 + (-100/28) × 10,76 = -16,4 (this value is in the range from -25 to 25 points)

Result: Diet with low intensity of pro-healthy and non-healthy characteristics.

***Interpretation:** The neutral diet characteristics of health effects are predicted. In order to improve the overall quality of the respondent's diet, it is recommended to decrease the frequency of consumption of food with a potentially negative health influence and increase the frequency of consumption of food with a potentially beneficial influence on health (Fig. 1).*

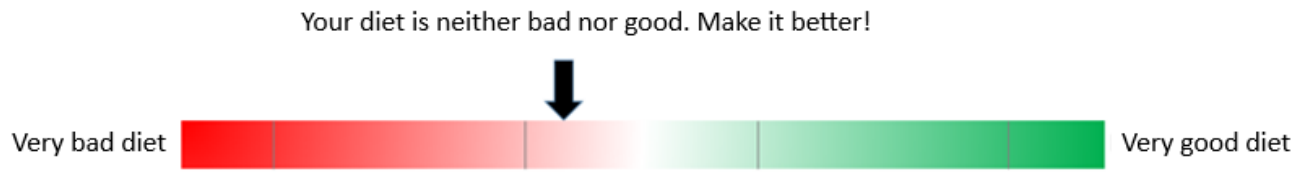

Fig. 1. Example, graphical presentation of an individual user's DQI result (DQI=-16.4)

3.5.3. Part C. Nutrition beliefs

It is recommended to analyse all the statements from part C for each respondent. It is not advised to interpret single statements from this set, because the statements have very variable level of difficulty.

The answers given by the respondent in part C require classification for correct and wrong as well as recoding. The correct answers for the set of statements concerning food and nutrition knowledge is included in table 17.

Table 17. Correct answers for the set of statements concerning food and nutrition knowledge (statements 55-79)

Statement	Correct answer	Points
55. It is enough to eat wholegrains/cereals once a day.	False	1
56. Only children and adolescents should drink milk.	False	1
57. Fruit and/or vegetables should be consumed with every meal.	True	1
58. Consumption of mouldy bread can result in food poisoning caused by *Salmonella.*	False	1
59. High intakes of salt protect from hypertension.	False	1
60. Limiting high-fat foods in everyday diet is protective against cardiovascular diseases.	True	1
61. Frequent consumption of oily fish contributes to atherosclerosis.	False	1
62. Frequent consumption of grilled meats contributes to the onset of cancer.	True	1
63. Vegetarian diet increases the risk of anaemia.	True	1
64. Bio-yoghurts contain beneficial gut bacteria.	True	1
65. Vegetable oils and olive oil contain a high amount of cholesterol.	False	1
66. Wholemeal bread have more fibre than white bread.	True	1
67. Fruit and vegetables are a source of 'empty calories'.	False	1
68. Butter and fortified margarines have high content of vitamin A and D.	True	1
69. Cheese is a better source of calcium than cottage cheese.	True	1
70. Offal has high amounts of 'bad' cholesterol - LDL.	False	1
71. In a healthy diet, complex carbohydrates should be replaced with simple sugars.	False	1
72. In a balanced diet, proteins should be the main source of energy.	False	1
73. Inadequate intakes of vitamin PP can cause skin inflammation and diarrhoea.	True	1
74. Sun exposure increases the synthesis of vitamin D in the human body.	True	1
75. Phosphorus is a component of neural tissue.	True	1
76. The ratio of calcium to phosphorus in a healthy diet should be 1:1.	True	1
77. Consumption of fruit with high content of vitamin C increases bioavailability of iron.	True	1
78. Starting cooking vegetables in cold water helps to preserve the nutrients.	False	1
79. Sweets and animal fats are particularly high nutrient dense foods.	False	1

Tables 18 and 19 present suggestions of statement recoding and respondent grouping. The created groups of respondents can be used in the further result analysis, for example to compare the dietary characteristics between respondents with different level of knowledge concerning food and nutrition.

Suggestion I:

All the statements, for every correct answer ("True" or "False") etiquette "Correct" should be assigned and for each wrong answer ("True" or "False") etiquette "Wrong". It is possible to mark them with codes, to facilitate the development of formulas during the result analysis. It is comfortable to use different codes, example (11) and (22) to avoid mistakes and differentiate it from the original codes assigned in the questionnaire, i.e. (1) and (2). The answer "Unsure" does not need recoding.

Recoded data can be used for grouping and distinction of the respondents, who for example, answered for over half correctly (>12), gave over a half wrong answers or "Unsure" answers.

Table 18. Example of recoding (I) of the answers for the set of statements concerning food and nutrition (statements 55-79) and proposed respondents grouping

Recoding (I)		Respondents grouping (I)
Text etiquette	Code*	A. Respondents, who were "Correct" over 50% (>12)
"Correct"	(11)	B. Respondents, who were "Wrong" over 50% (>12)
"Wrong"	(22)	C. Respondents, who were "Unsure" over 50% (>12)
"Unsure"	(3)	D. Remaining respondents

* it is not necessary to assign the code, but it can be helpful in writing calculation formulas

Suggestion II:
All the statements should have 1 point assigned for every correct answer ("True" or "False") and 0 points for the wrong answer or "Unsure" and then summarise the points. In this approach the evaluated and interpreted are only the correct answers. Its benefit is a good power of differentiation of the respondents into groups with a different level of nutrition knowledge.

Table 19. Example of recoding (II) of the answers for the set of statements concerning food and nutrition (statements 55-79) and proposed respondents grouping

Recoding (II)		Respondents grouping (II)	
Text etiquette	Points	Nutrition knowledge level	Total points
"Correct"	1	Insufficient	0-8
"Wrong"	0	Sufficient	9-16
"Unsure"	0	Good	17-25

Example 7

In the statements concerning food and nutrition the respondent marked the answers shown in the table 20.

Table 20. Answers to the statements concerning food and nutrition (statements 55-79) marked by the respondent

Statement	*Answer*	*Points*
55. It is enough to eat wholegrains/cereals once a day.	*False*	*1*
56. Only children and adolescents should drink milk.	*True*	*0*
57. Fruit and/or vegetables should be consumed with every meal.	*True*	*1*
58. Consumption of mouldy bread can result in food poisoning caused by Salmonella.	*True*	*0*
59. High intakes of salt protect from hypertension.	*False*	*1*
60. Limiting high-fat foods in everyday diet is protective against cardiovascular diseases.	*Unsure*	*0*
61. Frequent consumption of oily fish contributes to atherosclerosis.	*False*	*1*
62. Frequent consumption of grilled meats contributes to the onset of cancer.	*True*	*1*
63. Vegetarian diet increases the risk of anaemia.	*False*	*0*
64. Bio-yoghurts contain beneficial gut bacteria.	*Unsure*	*0*
65. Vegetable oils and olive oil contain a high amount of cholesterol.	*False*	*1*
66. Wholemeal bread have more fibre than white bread.	*True*	*1*
67. Fruit and vegetables are a source of 'empty calories'.	*False*	*1*
68. Butter and fortified margarines have high content of vitamin A and D.	*True*	*1*
69. Cheese is a better source of calcium than cottage cheese.	*True*	*1*
70. Offal has high amounts of 'bad' cholesterol - LDL.	*True*	*0*
71. In a healthy diet, complex carbohydrates should be replaced with simple sugars.	*False*	*1*
72. In a balanced diet, proteins should be the main source of energy.	*False*	*1*
73. Inadequate intakes of vitamin PP can cause skin inflammation and diarrhoea.	*False*	*0*
74. Sun exposure increases the synthesis of vitamin D in the human body.	*True*	*1*
75. Phosphorus is a component of neural tissue.	*Unsure*	*0*
76. The ratio of calcium to phosphorus in a healthy diet should be 1:1.	*Unsure*	*0*
77. Consumption of fruit with high content of vitamin C increases bioavailability of iron.	*True*	*1*

78. Starting cooking vegetables in cold water helps to preserve the nutrients.	*True*	*0*
79. Sweets and animal fats are particularly high nutrient dense foods.	*False*	*1*

The data has been developed according to the scheme presented in suggestion II.

Total number of points = 15 points (between range 9-16 points).

Result: The respondent has a sufficient nutrition knowledge.

3.5.4. Part D. Lifestyle and personal data

The date of the interview and date of birth of the respondents should be used to calculate metrical age of the respondents. The age of adults can be calculated in the simplified way, with the accuracy to the whole years, by subtracting the year of birth from the year of the interview. For the respondents below age of 18, it is recommended to calculate the age with accuracy to the whole months. In this case, the specific real number should be assigned to each month according to below scheme:

- January = 0.083
- February = 0.166
- March = 0.249
- April = 0.332
- May = 0.415
- June = 0.498
- July = 0.581
- August = 0.664
- September = 0.747
- October = 0.830
- November = 0.913
- December = 0.996

The next step is to make new variables coding the "year and month of the interview" as well as "year and month of birth". The "accurate metric age" should be calculated, which will reflect the biological age better than the full years age.

Example 8
Date of the interview: 20th January 2014
Date of birth of the respondent: 5th December 1997
Coding variable "year and month of the interview": 2014.083
Coding variable "year and month of birth": 1997.996
The metric age calculated from the full ages only: 2014-1997= 17 years old
The metric age calculated with months: 2014.083-1997.996= 16.087 years old

Questions no. 90 and 91 concerning physical activity can be analysed and interpreted:

- independently from each other, for example calculating % of respondents with low, medium, or high physical activity:
  - during work or at school (question no. 90),
  - during free time (question no. 91),
- together, after joining two question categories into one criterion of physical activity – recommended way shown in table 21.

Table 21. Recommended way of joining two categories of questions concerning physical activity (no. 90 and 91)

Physical activity at work or at school (question 90)	Physical activity in the free time (question 91)		
	Low (1)	Moderate (2)	High (3)
Low (1)	Low	Low	Moderate
Moderate (2)	Low	Moderate	Moderate
High (3)	Moderate	Moderate	High

It is recommended to take body mass, height and waist measurements of the respondents. The declared by the respondents numbers can be collected if there is no possibility of taking a measurement. The declared numbers by the respondents can be used to calculate anthropometric indicators, such as BMI, WHtR:

- directly (without any modifications),
- after correction with regression formulas (picked accordingly to age and gender of the respondent) in order to approximate to accurate values (measured) and decrease the bias – this way is definitely recommended, if the measures were not performed.

Regression formulas to correct the body mass and height declared are shown below (Niedzwiedzka et al. 2006, 2014).

Regression formulas for adolescents (Niedzwiedzka et al. 2006)

Boys age 13-20

Measured_body mass (kg) = 0.9839 x declared_body mass (kg) + 0.0861 x age (years) (±2.6455)

Measured_height (cm) = 0.9590 x declared_height (cm) + 0.1938 x age (years) + 3.8458 (±2.3951)

Girls age 13-20

Measured_body mass (kg) = 0.9740 x declared_body mass (kg) + 0.1210 x age (years) (±3.1251)

Measured_height (cm) = 0.9428 x declared_height (cm) + 9.4831 (±2.5405)

Regression formulas for elderly (Niedzwiedzka et al. 2014)

Men age 64-90

Measured_body mass (kg) = 0.9991 x declared_body mass (kg) (±3.639)

Measured_height (cm) = 0.9976 x declared_height (cm) (±3.5833)

Women age 64-94

Measured_body mass (kg) = 1.0166 x declared_body mass (kg) (±3.5631)

Measured_height (cm) = 31.4867+ 0.7874 x declared_height (cm) (±3.3778)

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