Protein Screener older adults (Pro^{55+}) – SPSS coding

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Website tool: www.proteinscreener.nl

Development paper: Wijnhoven HAH, Elstgeest LEM, de Vet HCW, Nicolaou M, Snijder MB, Visser M (2018) Development and validation of a short food questionnaire to screen for low protein intake in community-dwelling older adults: The Protein Screener 55+ (Pro55+). PLoS ONE 13(5): e0196406. https://doi.org/10.1371/journal.pone.0196406

Aim of this document: this document contains information to calculate the predicted probability on a protein intake <1.0 g/kg adj BW/d based on data collected by for example a paper questionnaire. These predicted probabilities can also be calculated by using the online tool www.proteinscreener.nl.

More information on the application and use of the predicted probability can be found on the online tool website.

Content of this document:

1. Variable names and coding in SPSS

The following questions are about <u>your</u> dietary habits. It is very important that you give an honest response. We would like to know what you ate or drank in the last 4 weeks (irrespective of week days, weekend days, at home or someplace else). If the last 4 weeks were very special (for example you were sick or you went on a vacation and this had a major influence on your usual diet), please recall the 4 weeks <u>before</u> this period.

Please enter your body measurements	
Measure/question on current:	*SPSS variable*
Age (year)	*age*
Weight (kg)	weight
Length (cm)	height_m

These questions are about what <u>you</u> eat, not what another person in the household eats.

In the following questions, we ask how much of a food product you ate			
SPSS variable N05b_0	1. In the last 4 weeks, how many slices of bread did you on average eat on a day that you ate bread?		
	SPSS coding		
	1	☐	Less than 1
	2	☐	1 slice
	3	☐	2 slices
	4	☐	3 slices
	5	☐	4 slices
	6	☐	5 slices
	7	☐	6 slices
	8	☐	7 slices
	9	☐	8 slices
	10	☐	9 slices
	11	☐	10 slices
	12	☐	11 slices
	13	☐	12 slices
	14	☐	> 12 slices

SPSS variable N15b_0	2. In the last 4 weeks, how many glasses/cups of milk, buttermilk or soy milk did you on average drink on a day that you drank this?		
	SPSS coding		
	1	☐	Less than 1 glass
	2	☐	1 glass
	3	☐	2 glasses
	4	☐	3 glasses
	5	☐	4 glasses
	6	☐	5 glasses
	7	☐	6 glasses
	8	☐	7 glasses
	9	☐	8 glasses
	10	☐	9 glasses
	11	☐	10 glasses
	12	☐	11 glasses
	13	☐	12 glasses
	14	☐	> 12 glasses
SPSS variable N34b	3. How much meat did you on average eat on a day that you ate meat with your warm meal in the last 4 weeks?		
	SPSS coding		*(see pictures at the end of this document)*
	0	☐	Not applicable, does not eat meat
	1	☐	1/5 plate
	2	☐	1/4 plate
	3	☐	1/2 plate
	4	☐	2/3 plate
	5	☐	3/4 plate
In the following questions, we will ask how often you ate a certain product			
SPSS variable N18a_0	4. In the last 4 weeks how often did you yoghurt, quark, milk-based pudding, or soy dessert?		
	SPSS coding		
	1	☐	Not in these 4 weeks
	2	☐	1 day in 4 weeks
	3	☐	2 -3 days in 4 weeks
	4	☐	1 day/week

	5	☐	2 days/week
	6	☐	3 days/week
	7	☐	4 days/week
	8	☐	5 days/week
	9	☐	6 days/week
	10	☐	7 days/week
SPSS variable N14a_0	5. In the last 4 weeks how often did you eat egg with either your breakfast, lunch, evening meal, as a snack, or in a meal?		
	SPSS coding		
	1	☐	Not in these 4 weeks
	2	☐	1 day in 4 weeks
	3	☐	2 -3 days in 4 weeks
	4	☐	1 day/week
	5	☐	2 days/week
	6	☐	3 days/week
	7	☐	4 days/week
	8	☐	5 days/week
	9	☐	6 days/week
	10	☐	7 days/week
SPSS variable N24a_0	6. In the last 4 weeks how often did you eat pasta or noodles (like spaghetti, macaroni, lasagna, chow mein, rice-based or wheat-based noodles)?		
	SPSS coding		
	1	☐	Not in these 4 weeks
	2	☐	1 day in 4 weeks
	3	☐	2 -3 days in 4 weeks
	4	☐	1 day/week
	5	☐	2 days/week
	6	☐	3 days/week
	7	☐	4 days/week
	8	☐	5 days/week
	9	☐	6 days/week
	10	☐	7 days/week

SPSS variable N33a_0	7. In the last 4 weeks how often did you eat fish with your bread meal, warm meal, or as a snack? (Do NOT include shellfish).		
	SPSS coding		
	1	☐	Not in these 4 weeks
	2	☐	1 day in 4 weeks
	3	☐	2 -3 days in 4 weeks
	4	☐	1 day/week
	5	☐	2 days/week
	6	☐	3 days/week
	7	☐	4 days/week
	8	☐	5 days/week
	9	☐	6 days/week
	10	☐	7 days/week
SPSS variable N62a_0	8. In the last 4 weeks, how often did you eat nuts or peanuts as a snack?		
	SPSS coding		
	1	☐	Not in these 4 weeks
	2	☐	1 day in 4 weeks
	3	☐	2 -3 days in 4 weeks
	4	☐	1 day/week
	5	☐	2 days/week
	6	☐	3 days/week
	7	☐	4 days/week
	8	☐	5 days/week
	9	☐	6 days/week
	10	☐	7 days/week

SPSS variable N08a_0	9. In the last 4 weeks how often did you eat cheese or cheese spread on your bread, bun, rusk, cracker, etc.?		
	SPSS coding		
	1	☐	Not in these 4 weeks
	2	☐	1 day in 4 weeks
	3	☐	2 -3 days in 4 weeks
	4	☐	1 day/week
	5	☐	2 days/week
	6	☐	3 days/week
	7	☐	4 days/week
	8	☐	5 days/week
	9	☐	6 days/week
	10	☐	7 days/week
SPSS variable N08b_0	10. How many slices of bread, bun, rusk, cracker, etc. with cheese or cheese spread did you on average eat on a day that you ate cheese or cheese spread?		
	SPSS coding		
	1	☐	Less than 1
	2	☐	1 slice
	3	☐	2 slices
	4	☐	3 slices
	5	☐	4 slices
	6	☐	5 slices
	7	☐	6 slices
	8	☐	7 slices
	9	☐	8 slices
	10	☐	9 slices
	11	☐	10 slices
	12	☐	11 slices
	13	☐	12 slices
	14	☐	> 12 slices

2. SPSS syntax to calculate predicted probabilities

***step 1. Calculate (adjusted) body weight.**

```
compute BMI = weight/ (height_m * height_m).
execute.
IF  (BMI < 18.5 & age < 71) weight_adj=(height_m) * (height_m) * 18.5.
execute.
IF  (BMI > 25.0 & age < 71) weight_adj=(height_m) * (height_m) * 25.
execute.
IF  (BMI >= 18.5 & BMI <= 25 & age < 71) weight_adj=weight.
execute.
IF  (BMI < 22.0 & age >= 71) weight_adj=(height_m) * (height_m) * 22.
execute.
IF  (BMI > 27.0 & age >= 71) weight_adj=(height_m) * (height_m) * 27.
execute.
IF  (BMI >= 22.0 & BMI <= 27.0 & age >= 71) weight_adj=weight.
execute.
```

*** step2. Recode food intake questions.**

```
* recode slices of bread (N05b_0).
RECODE N05b_0  (1 thru 3 = 1) (4=2) (5=1) (6 thru highest=1) (MISSING=SYSMIS) INTO
   amount_slice_breadd1.
EXECUTE.
RECODE N05b_0  (1 thru 3 = 1) (4=1) (5=2) (6 thru highest=1) (MISSING=SYSMIS) INTO
   amount_slice_breadd2.
EXECUTE.
RECODE N05b_0  (1 thru 3 = 1) (4=1) (5=1) (6 thru highest=2) (MISSING=SYSMIS) INTO
   amount_slice_breadd3.
EXECUTE.

* recode glasses of milk (N15b_0).
RECODE N15b_0 (1=1) (2=2) (3 thru highest=1) (ELSE=SYSMIS) INTO
   amount_milkd1.
EXECUTE.
RECODE N15b_0 (1=1) (2=1) (3 thru highest=2) (ELSE=SYSMIS) INTO
   amount_milkd2.
EXECUTE.

*recode amount meat warm meal (N34b).
RECODE N34b (0=1) (1=1) (2=2) (3=1) (4=1) (5=1) (ELSE=SYSMIS) INTO
   amount_meatd1.
EXECUTE.
RECODE N34b (0=1) (1=1) (2=1) (3=2) (4=2) (5=2) (ELSE=SYSMIS) INTO
```

```
   amount_meatd2.
EXECUTE.

*recode frequency egg intake (N14a_0).
RECODE N14a_0   (1=1) (2=1) (3=1) (4=2) (5=1) (6 thru highest=1) (MISSING=SYSMIS) INTO
   freq_eggd1.
EXECUTE.
RECODE N14a_0   (1=1) (2=1) (3=1) (4=1) (5=2) (6 thru highest=1) (MISSING=SYSMIS) INTO
   freq_eggd2.
EXECUTE.
RECODE N14a_0   (1=1) (2=1) (3=1) (4=1) (5=1) (6 thru highest=2) (MISSING=SYSMIS) INTO
   freq_eggd3.
EXECUTE.

* recode frequency dairy dessert (N18a_0).
RECODE N18a_0  (1=1) (2=1) (3=1) (4=2) (5=3) (6=4) (7=5) (8=6) (9=7) (10=8) (MISSING=SYSMIS) INTO
   freq_dairy_dessert.

*recode frequency pasta (N24a_0).
RECODE N24a_0  (1=1) (2=1) (3=2) (4=1) (5 thru highest=1) (MISSING=SYSMIS) INTO
   freq_pastad1.
EXECUTE.
RECODE N24a_0  (1=1) (2=1) (3=1) (4=2) (5 thru highest=1) (MISSING=SYSMIS) INTO
   freq_pastad2.
EXECUTE.
RECODE N24a_0  (1=1) (2=1) (3=1) (4=1) (5 thru highest=2) (MISSING=SYSMIS) INTO
   freq_pastad3.
EXECUTE.

*recode frequency fish (N33a_0).
RECODE N33a_0  (1=1) (2=1) (3=2) (4=1) (5 thru highest=1) (MISSING=SYSMIS) INTO
   freq_fishd1.
EXECUTE.
RECODE N33a_0  (1=1) (2=1) (3=1) (4=2) (5 thru highest=1) (MISSING=SYSMIS) INTO
   freq_fishd2.
EXECUTE.
RECODE N33a_0  (1=1) (2=1) (3=1) (4=1) (5 thru highest=2) (MISSING=SYSMIS) INTO
   freq_fishd3.
EXECUTE.

* recode frequency peanuts (N62a_0).
RECODE N62a_0 (1=1) (2=2) (3=2) (4 thru highest =1) (MISSING=SYSMIS) INTO
   freq_peanutsd1.
RECODE N62a_0 (1=1) (2=1) (3=1) (4 thru highest =2) (MISSING=SYSMIS) INTO
   freq_peanutsd2.
```

```
*recode frequency cheese on bread (N08a_0).
RECODE N08a_0  (1=1) (2=1) (3=1) (4=2) (5=3) (6=4) (7=5) (8=6) (9=7) (10=8) (MISSING=SYSMIS) INTO
   freq_cheese_on_bread.
EXECUTE.

*recode amount bread with cheese (N08b_0).
RECODE N08b_0  (1=1) (2=1) (3=2) (4 thru highest = 3) (MISSING=SYSMIS) INTO
   amount_bread_with_cheese.
EXECUTE.
RECODE N08b_0 (1=1) (2=1) (3=2) (4 thru highest = 1) (MISSING=SYSMIS) INTO
   amount_bread_with_cheesed1.
EXECUTE.
RECODE N08b_0 (1=1) (2=1) (3=1) (4 thru highest = 2) (MISSING=SYSMIS) INTO
   amount_bread_with_cheesed2.
EXECUTE.
```

***Step 3: Calculate predicted probabilities by the validated regression equation with shrinkage factor of 0.92.**
***pay attention to the minus sign before each regression coefficient.**

```
COMPUTE z = 0.92*19.361 +0.106*0.92*weight_adj -0.326*0.92*amount_slice_breadd1 -
1.175*0.92*amount_slice_breadd2 -2.750*0.92*amount_slice_breadd3 -
0.344*0.92*amount_milkd1 -1.681*0.92*amount_milkd2 -1.326*0.92*amount_meatd1 -
3.074*0.92*amount_meatd2 -0.175*0.92*freq_dairy_dessert -0.256*0.92*freq_eggd1 -
0.636*0.92*freq_eggd2 -1.480*0.92*freq_eggd3  -0.432*0.92*freq_pastad1  -
0.713*0.92*freq_pastad2 -1.409*0.92*freq_pastad3 -0.454*0.92*freq_fishd1 -
0.757*0.92*freq_fishd2 -1.100*0.92*freq_fishd3 -0.393*0.92*freq_peanutsd1 -
0.888*0.92*freq_peanutsd2 -0.177*0.92*freq_cheese_on_bread -
0.654*0.92*amount_bread_with_cheesed1 -1.214*0.92*amount_bread_with_cheesed2.
EXECUTE.

COMPUTE predprob = 1/(1 + EXP(-z)) .
EXECUTE.

VARIABLE LABELS  predprob 'predicted probability protein intake < 1.0 g/kg adj BW/d'.
```

3. Pictures for meat question (question number 3).

The first picture should be a picture depicting: "Not applicable, does not eat meat". For example with a red cross.