**/\*Calculation of the Healthy Eating Index-2015 component and total scores based on data from the Diet History Questionnaire II (DHQ II) output\*/**

/\*This SAS program, along with the required SAS macro, can be used to calculate Healthy Eating Index (HEI)-2015 scores from data collected using the DHQ II in conjunction with the most recent Diet\*Calc database, released Dec 2014, that includes values from the Food Patterns Equivalents Database (FPED). This program calculates HEI-2015 component and total scores for each individual and must be run in SAS version 9.4 or higher. \*/

**/\*INSTRUCTIONS – complete tasks 1-4 in this section, and run these SAS codes before proceeding to the HEI-2010 scoring program that follows\*/**

/\*1. Create a folder on your computer “home folder”, and save the ASA24 data, and the required HEI-2010 macros in it. Specify the path to the folder. \*/

%let home = C:\Documents\DHQ\_II\_files\_and\_computing\_the\_HEI; /\*In this Example, the “home” folder is in C Drive, within Documents, and is called “DHQ\_II\_files\_and\_computing\_the\_HEI” \*/

/\* 2. Filename here specifies the input file saved in your home folder. \*/

filename in “&home\results.txt”; \*this file should contain the dietcalc results file that used the most recent nutrient database that includes FPED values;

/\*3. Create a folder within the “home” folder, where the output file, containing HEI-2015 component and total scores for each respondent, for the intake day, are to be exported. Specify the name of the folder. \*/

filename out “&home\out\withhei.results.txt”; \*this file will be created and contains the dietcalc results file with HEI 2015 variables at the end;

/\*4. Read in required HEI-2015 scoring macro. This macro must be saved within the home folder. \*/

%include "&home\hei2015.score.macro.sas"; \*This macro is needed to perform the scoring;

/\*Step 1: Reads in the original Diet\*Calc results in two parts:

First, it reads in the variable names,

then it reads in the variable values.\*/

\*input the variable names - some will get jumbled in SAS so this will be used when creating the results file;

options obs=**1**;

**proc** **import** datafile= in

out=header

dbms=csv

replace;

getnames=no;

**run**;

\*the program will explore the input data to determine how many variables are present;

%global nvars;

**%macro** nvars(dsn);

%let dataset=&dsn;

%let dsid=%sysfunc(open(&dataset));

%if &dsid %then %do;

%let nvars=%sysfunc(attrn(&dsid,NVARS));

%let rc=%sysfunc(close(&dsid));

%end;

%else

%put Open for data set &dsn failed - %sysfunc(sysmsg());

&nvars

**%mend** nvars;

%put Number of Variables: %nvars(header);

\*input the values of the DHQ II results;

options obs=max;

**proc** **import** datafile= in

out=ffq

dbms=csv

replace;

getnames=yes;

**run**;

/\*Step 2: Creates six required variables: MONOPOLY, WHOLEFRT, VTOTALLEG, VDRKGRLEG, PFALLPROTLEG, PFSEAPLANTLEG. \*/

**DATA** ffq;

SET ffq;

WHOLEFRT=FPED\_F\_CITMLB\_CP\_EQUIV\_USDA + FPED\_F\_OTHER\_CP\_EQUIV\_USDA;

MONOPOLY=TOTAL\_MONOUNSAT\_FA\_G\_USDA + TOTAL\_POLYUNSAT\_FA\_G\_USDA;

VTOTALLEG= FPED\_V\_TOTAL\_CP\_EQUIV\_USDA + FPED\_V\_LEGUMES\_CP\_EQUIV\_USDA;

VDRKGRLEG= FPED\_V\_DRKGR\_CP\_EQUIV\_USDA + FPED\_V\_LEGUMES\_CP\_EQUIV\_USDA;

PFALLPROTLEG = FPED\_PF\_MPS\_TOTAL\_OZ\_EQUIV\_USDA + FPED\_PF\_EGGS\_OZ\_EQUIV\_USDA + FPED\_PF\_NUTSDS\_OZ\_EQUIV\_USDA + FPED\_PF\_SOY\_OZ\_EQUIV\_USDA + FPED\_V\_LEGUMES\_CP\_EQUIV\_USDA\***4**;

PFSEAPLANTLEG=FPED\_PF\_SEAFD\_HI\_OZ\_EQUIV\_USDA + FPED\_PF\_SEAFD\_LOW\_OZ\_EQUIV\_USDA + FPED\_PF\_SOY\_OZ\_EQUIV\_USDA + FPED\_PF\_NUTSDS\_OZ\_EQUIV\_USDA + FPED\_V\_LEGUMES\_CP\_EQUIV\_USDA\***4**;

**run**;

/\*Step 3. Runs the HEI-2015 scoring macro which calculates intake density amounts and HEI scores.\*/

%***HEI2015*** (indat=ffq,

kcal= ENERGY\_KCAL\_USDA,

vtotalleg= VTOTALLEG,

vdrkgrleg= VDRKGRLEG,

f\_total= FPED\_F\_TOTAL\_CP\_EQUIV\_USDA,

fwholefrt=WHOLEFRT,

g\_whole= FPED\_G\_WHOLE\_OZ\_EQUIV\_USDA,

d\_total= FPED\_D\_TOTAL\_CP\_EQUIV\_USDA,

pfallprotleg= PFALLPROTLEG,

pfseaplantleg= PFSEAPLANTLEG,

monopoly=MONOPOLY,

satfat= TOTAL\_SAT\_FA\_G\_USDA,

sodium= SODIUM\_MG\_USDA,

g\_refined= FPED\_G\_REFINED\_OZ\_EQUIV\_USDA,

add\_sugars= FPED\_ADD\_SUGARS\_TSP\_EQUIV\_USDA,

outdat=aftermac);

**run**;

/\*Step 4. Saves the results for each individual in a comma delimited text file with a name provided by the user.\*/

**data** complete;

set header aftermac;

**run**;

**data** \_null\_;

set complete;

file out DSD lrecl=**8000** DLM=',';

format

HEI2015\_TOTAL\_SCORE HEI2015C1\_TOTALVEG HEI2015C2\_GREEN\_AND\_BEAN HEI2015C3\_TOTALFRUIT

HEI2015C4\_WHOLEFRUIT HEI2015C5\_WHOLEGRAIN HEI2015C6\_TOTALDAIRY HEI2015C7\_TOTPROT HEI2015C8\_SEAPLANT\_PROT

HEI2015C9\_FATTYACID HEI2015C10\_SODIUM HEI2015C11\_REFINEDGRAIN HEI2015C12\_SFAT HEI2015C13\_ADDSUG

VEGDEN GRBNDEN FRTDEN WHFRDEN WGRNDEN DAIRYDEN PROTDEN SEAPLDEN FARATIO SODDEN RGDEN SFAT\_PERC ADDSUG\_PERC f8.2;

\*put one line of variable names;

if \_n\_=**1** then put var1 - var&nvars

'Total HEI-2015 Score,'

'HEI-2015 - Total Vegetables - Component Score,'

'HEI-2015 - Greens and Beans - Component Score,'

'HEI-2015 - Total Fruits - Component Score,'

'HEI-2015 - Whole Fruits - Component Score,'

'HEI-2015 - Whole Grains - Component Score,'

'HEI-2015 - Dairy - Component Score,'

'HEI-2015 - Total Protein Foods - Component Score,'

'HEI-2015 - Seafood and Plant Proteins - Component Score,'

'HEI-2015 - Fatty Acids - Component Score,'

'HEI-2015 - Sodium - Component Score,'

'HEI-2015 - Refined Grains - Component Score,'

'HEI-2015 - Saturated Fats - Component Score,'

'HEI-2015 - Added Sugars - Component Score,'

'HEI-2015 - Density of Total Vegetables per 1000 Kcal,'

'HEI-2015 - Density of Greens and Beans per 1000 Kcal,'

'HEI-2015 - Density of Total Fruits per 1000 Kcal,'

'HEI-2015 - Density of Whole Fruits per 1000 Kcal,'

'HEI-2015 - Density of Whole Grains per 1000 Kcal,'

'HEI-2015 - Density of Dairy per 1000 Kcal,'

'HEI-2015 - Density of Total Protein Foods per 1000 Kcal,'

'HEI-2015 - Density of Seafood and Plant Proteins per 1000 Kcal,'

'HEI-2015 - Fatty Acid Ratio,'

'HEI-2015 - Density of Sodium per 1000 Kcal,'

'HEI-2015 - Density of Refined Grains per 1000 Kcal,'

'HEI-2015 - Percent of Calories from Saturated Fats,'

'HEI-2015 - Percent of Calories from Added Sugars'

;

\*put values of all variables plus hei 2015 score info;

else put Respondent\_ID--Vegetables\_for\_adjust\_\_Flag

HEI2015\_TOTAL\_SCORE HEI2015C1\_TOTALVEG HEI2015C2\_GREEN\_AND\_BEAN HEI2015C3\_TOTALFRUIT

HEI2015C4\_WHOLEFRUIT HEI2015C5\_WHOLEGRAIN HEI2015C6\_TOTALDAIRY HEI2015C7\_TOTPROT HEI2015C8\_SEAPLANT\_PROT

HEI2015C9\_FATTYACID HEI2015C10\_SODIUM HEI2015C11\_REFINEDGRAIN HEI2015C12\_SFAT HEI2015C13\_ADDSUG

VEGDEN GRBNDEN FRTDEN WHFRDEN WGRNDEN DAIRYDEN PROTDEN SEAPLDEN FARATIO SODDEN RGDEN SFAT\_PERC ADDSUG\_PERC;

**run**;