A systematic review of brief dietary questionnaires suitable for clinical use in the prevention and management of obesity, cardiovascular disease and type 2 diabetes

England, CY; Andrews, RC; Jago, R; Thompson, JL

DOI:
10.1038/ejcn.2015.6

Document Version
Peer reviewed version

Citation for published version (Harvard):
England, CY, Andrews, RC, Jago, R & Thompson, JL 2015, 'A systematic review of brief dietary questionnaires suitable for clinical use in the prevention and management of obesity, cardiovascular disease and type 2 diabetes', *European Journal of Clinical Nutrition*, vol. 69, pp. 977–1003. https://doi.org/10.1038/ejcn.2015.6

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Healthy Eating						
Australian Diet Quality Tool (DQT) O'Reilly (2012)[50] Australia	i) Validation[1] (n=37) ii) Acceptability[2] (n=33)	i) Cardiac rehab patients ii) Health professionals (n=25), cardiac rehab patients (n=8)	NR NR	i) 13.5% women; age=61.2 (10.8); BMI=28.7 (4.1) ii) NR	English 13 questions (food frequency and behavioural) Portions described by household measures 11 minutes to complete Unspecified timescale	1 total score derived by summing responses Higher scores indicate more desirable habits Cut-offs used to define diets as healthy/unhealthy 5 subscale scores ('F+V' 'saturated fat' and total fat', 'omega 3s' 'fibre' and 'salt') can also be calculated by summing appropriate responses
Bailey Elderly Food Screener (B-Elder) 1) Bailey (2007)[51] USA 2) Bailey (2009)[28] USA	1) i) Item generation; validation (n=179) ii) Acceptability (n=17) 2) Validation (n=206)	1) General community 2) General community	1) 99% White American 2) 98% White American	1) i) 54.7% women; age=73.0 (5.0); 80% high school education ii) "similar" gender distribution to other samples 2) 59.7% women; age=78.5 (4.0); 82.0% high school education	English 25 questions (food frequency and behavioural) Portions are not described 15 minutes to complete Diet over last month	1 total score derived by summing responses Higher scores indicate more desirable habits Cut-offs used to define diets as healthy/unhealthy

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Food Behaviour Checklist (FBC) Text version (FBC-T) 1) Murphy (2001)[10] USA 2) Townsend (2003)[52] USA	1) Item generation; internal reliability; validation (n=100) 2) Item generation; test-retest; internal reliability (n=44)	1) General community 2) General community	1) 46% African American; 23% Hispanic; 21% White American; 3% Native American; 7% other 2) NR	1) 100% women; age=32.9 (8.9); mean of 12 years education; low SES 2) Test-retest sample was a subset of validation sample; internal reliability redone	English 16 questions (food frequency and behavioural) Portions are not described 10 minutes to complete Unspecified timescale	7 subscale scores are calculated ('Fruit and vegetables', 'Milk', 'fat and cholesterol', 'diet quality' and 'food security') by summing responses in that category and dividing by the number of questions Higher scores indicate more desirable habits
Food Behaviour Checklist, visually enhanced version (FBC-V) 1) Townsend (2008)[43] USA	1) i) Acceptability (n=43) ii) Acceptability (n=15)	1) i) General community ii) University; work site	1) i) "English speaking, non-Hispanic black, non-Hispanic white, and Hispanic clients" ii) Academic nutrition staff ('professionals') (n=6); Nutrition educators ('paraprofessionals') (n=10)	1) i) 84% women; low SES ii) No details	English Includes photographs 16 questions (food frequency and behavioural) Portions are not described No completion time estimated Unspecified timescale	As FBC-T

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Spanish translation of FBC-V (FBC-SV) 2) Banna (2010)[32] USA 3) Banna (2011)[44] USA	2) Acceptability (n=20) 3) i) Test-retest (n=71) ii) Validation (n=82) iii) Internal reliability (n=153)	2) General community 3) General community	2) 95% Hispanic 3) Hispanic	2) n=20 (100% women) (face validity) 3) i) 100% women; low income ii) 100% women; age=36; BMI=31.1 (6.7); low income iii) Validation and reliability sample combined for internal reliability	Spanish (USA) translation of FBC-V	As FBC-T
Healthy Eating Vital Signs (HEVS) 1) Greenwood (2008)[8] USA 2) Greenwood (2012)[53] USA	1) i) Acceptability (n=48) ii) Validation (n=261) 2) Validation; internal reliability (n=60)	1) Primary care 2) Primary care clinic staff	1) i) 79% White American ii) 80% White American 2) 54% White American; 25% Hispanic	1) i) 55.4% women); age=42.6 (12.1) ii) 58.2% women; age=38.4 (11.7); BMI=27.7 (7.2); mean number of years of schooling = 15.7 (3.4) 2) 93.3% women; age=38.3 (9.6); 68% BMI>25; 100% > high school education	English 14 questions (food frequency and behavioural) Soft drink portions described as cans 1 minute to complete Both 1 day recall (yesterday) and typical recall with no timescale	Individual answers are considered separately and no scores are calculated

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Latino Dietary Behaviors Questionnaire (LDBQ)[t] Fernandez (2011)[54] USA	Item generation; internal reliability; validation (n=252)	Primary care	100% Hispanic	76.6% women; age=55.2 (11.2); BMI=34.8 (7.0); about 75% < high school education; 50% household income <$10,000	Spanish (USA and Central America) 13 questions (food frequency and behavioural) Portions are not described No completion time estimated Unspecified timescale	1 total score derived by summing responses Higher scores indicate more desirable habits
PrimeScreen Rifas-Shirman (2001)[55] USA	Test-retest; validation; acceptability (n=160)	Primary care	63% White American, 31% African American	56.9% women; age=48.0 (range, 19-65); BMI=27.3 (range, 15.5-57.7); 59% college graduates; 59% executive or professional	English 15 food-based questions (food frequency and behavioural) + 8 questions on vitamin / mineral supplements Portions are not described 5 minutes to complete Diet over last year	In clinic individual answers are coded using traffic light codes (red, yellow, green) for food items (It is possible to calculate nutrient intakes for research purposes but this requires population specific nutrient and food consumption databases)

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Rapid Eating Assessment for Patients (REAP) Gans (2006)[29] USA	i) Acceptability (n=61) ii) Validation (n=44) iii) Acceptability (n=31) iv) Test-retest; validation (n=94)	i) Physicians and medical students ii) Undergraduates iii) Work site; students iv) General community	i) NR ii) NR iii) 50% 'people of colour' iv) 94% White American	i) NR ii) NR iii) 62% female; age=32 (range, 20-60); 96% some college education; 76% household income < $76,000 iv) 57.4% women; age=43.2 (12.5) ; 57% completed high school; median income range $51,000-$60,000	English 31 questions (behavioural) Portions described by weight 10 minutes to complete Unspecified timescale	In clinic individual answers are considered separately and a "physician key" is provided to guide discussion and advice
Rapid Eating Assessment for Patients short form (REAP-S) Segal-Isaacson (2004)[14] USA	Validation (n=49)	Undergraduates	65% White American, 21% Asian	44.5% women; age=24.2 (3.8); BMI=23.4 (5.0); some college	English 16 questions (behavioural) Portions described by weight No completion time estimated Unspecified timescale	As REAP
Short Diet Quality Screener (sDQS) Schroder (2012)[13] Spain	Validation (n=102)	General community	NR	n=102 (49% women); age=58.6 (12.1); BMI=27.6 (4.2); 62.7% > primary school education	Spanish (European) 18 questions (food frequency) Portions described in household measures No completion time estimated Diet over last year	1 total score derived by summing responses Higher scores indicate greater adherence to healthy eating

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Mediterranean Diet						
Brief Mediterranean Diet Screener[t] (bMDSC) Schroder (2012)[13] Spain	Developed in the same population as the sDQS				Spanish (European) 15 questions (food frequency) Portions described in household measures No completion time estimated Diet over last year	1 total score derived by summing responses Higher scores indicate greater adherence to Mediterranean diet
Mediterranean Diet Adherence Score[t] (MEDAS) Schroder (2011)[56] Spain	Validation (n=7146)	Primary care	NR	57.2% women; age=67; BMI=30	Spanish (European) 14 questions (food frequency and behavioural) Portions described in household measures No completion time estimated Unspecified timescale	1 total score derived by summing responses Higher scores indicate greater adherence to Mediterranean diet
Total fat						
Dutch fat consumption questionnaire[t] (D-Fat1) Van Assema (1992)[57] Netherlands	i) Test-retest (n=639) ii) Validation (n=52)	General community	NR	i) 52.1%; age range=18-93 ii) 55.8% women; age range=21-68	Dutch 25 questions (food frequency and behavioural) Portions described in household measures No completion time estimated Diet over last 6 months	1 total score derived by summing responses Lower scores indicate lower fat diet

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Fat-Related Diet Habits Questionnaire / Kristal's Food Habits Questionnaire (FRDHQ) 20 item version 1) Kristal (1990)[11] USA 2) Birkett (1995)[46] Canada	1) Test-retest; internal reliability; validation (n=97) 2) Internal reliability; validation (n=354)	1) Primary care 2) Work site	1) NR 2) NR	1) 100% women; age=51.5 (4.3); BMI=24.5 (3.5); 60.0% completed college; 57.2% household income >$40,000 2) 100% men; age=41.0 (9.8); BMI=28.5 (4.4); 100% manual workers; mean number of years education=12.4 (3.3); 56.9% household income > CA$40,000	English 20 /25 questions (behavioural) Interview administered and self- administered versions of both older 20 item and newer 25 item available Portions are not described No completion time estimated	1 total score derived by summing responses 5 behavioural subscales can be calculated by summing responses in that category and dividing by the number of questions Lower scores indicate lower fat habits
3) Glasgow (1996)[21] USA	3) i) Validation (n=1022) ii) Validation (n=105) iii) Test-retest (n=89 / 39)	3) i) Work site ii) Primary care	3) NR	3) i) "majority blue collar" ii) 60% women; age=63 iii) Test-retest samples were subsets of validation sample	Diet over last month	
24 item version 4) Spoon (2002)[47] USA	4) i) Internal reliability (n=178) ii) Test-retest (n=42) iii) Validation (n=32)	4) Work site	4) 82% White American	4) i) 40.0% women; age=40.7 (10.6); BMI=27.1 (27.1); 24% completed college; 29% < $12,000 ii) Test-retest sample was a subset of internal reliability sample iii) Validation was a different subset of internal reliability sample		

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Short Fat Questionnaire (SFQ) Dobson (1993)[56] Australia	i) Acceptability ii) Validation (n=90) iii) Test-retest (n=25)	NR ii) General community; work site	NR	i) NR ii) NR iii) Test-retest sample is a subset of the validation sample	English 17 questions (food frequency and behavioural) Portions are not described 3 minutes to complete Unspecified timescale	1 total score derived by summing responses Lower scores indicate lower fat diet
Sister Talk Food Habits (short form) (SisterTalk-S) Anderson (2007)[3] USA	Internal reliability; validation (n=95)	Primary care	100% African American	100% women (49 participants completed Sister Talk at phase 1 and 2 but test-retest not calculated)	English 30 questions (food frequency) Portions are not described No completion time estimate Diet over the last 3 months	1 total score derived by summing responses then dividing by the number of non-missing questions Lower scores indicate lower fat habits
Starting the Conversation (STC) Paxton (2011)[39] USA	i) Validation; internal reliability (n=372) ii) Test-retest (n=114)	Primary care	NR	i) 49.7% women; age=58.4 (9.2); BMI=34.8 (6.5); 19.1% high school or less; 47.3% household income <$49,999 ii) Test-retest was a subsample of validation study	English 8 questions (food frequency and behavioural) Portions are not described No completion time estimate Diet over the “past few months”	1 total score derived by summing responses Lower scores indicate more desirable habits

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Specific dietary fats and / or dietary cholesterol						
Dietary Fat Quality Assessment (DFA) Kraschnewski (2013)[60] USA	i) Validation (n=120) ii) Test-retest (n=96)	Primary care	51% White American; 48% African American	i) 100% women; age=51.0 (0.7); BMI=38 (0.4); 65% low SES; 60% high school education or less ii) Test-retest sample was a subset of the validation sample	English 20 questions (food frequency) Portions described as undefined 'servings' 6 minutes to complete Unspecified timescale	1 total score derived by summing responses Higher scores indicate lower fat diet
Heart Disease Prevention Project Screener (HDPPS) Heller (1981)[61] UK	i) Test-retest (n=22) ii) Validation (n=68)	Work site	NR	i) 100% men ii)100% men	English 10 questions (food frequency and behavioural) Portions described by weight No completion time estimate Unspecified timescale	1 total score derived by summing responses Lower scores indicate lower fat diets

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
MEDFICTS (Meats, Eggs, Dairy, Fried foods, fat In baked goods, Convenience foods, fats added at the Table and Snacks) 1) Kris-Etherton (2001)[12] 2) Taylor (2003)[62] 3) Teal (2007)[63] 4) Mochari (2008)[64] USA	1) i) Validation (n=22) ii) Validation (n=26) iii) Validation (n=16) 2) Validation (n=164) 3) Validation (n=184) 4) Validation (n=501)	1) i) Primary care ii) Primary care iii) Pre-existing food diaries 2) Armed forces 3) Primary care 4) Primary care	1) NR 2) 65.9% White American 3) 100% African American 4) 64.4% White American; 24% Hispanic	1) i) NR ii) NR iii) NR 2) 20.1% women; age=42.0 (2.0); BMI=27.0 (4.0)78.4% college educated 3) n=184 (100% women); age=36.7 (5.3); BMI=30.7 (6.9) 4) 65.9% women; 96.4% high school or greater	English 20 questions (food frequency) Portions described by weight and people are asked to indicate 'small', 'medium' or 'large' servings No completion time estimated Unspecified timescale	1 total score derived by summing responses Lower scores indicate greater adherence to diet Cut-offs used to define diets as adherent / non adherent
NLSChol Questionnaire[t] Beliard (2012)[58] France	i) Acceptability (n=131) ii) Test-retest (n=20) iii) Validation (n=58) iv) Internal reliability (n=1048)	Primary care	NR	i) 45% women); age=60.9 (15.5); BMI=26.9 (6.5) ii) NR iii) 39.7% women; age=58.0 (16.0); BMI=27.0 (8.0) iv) 56.9% women; age=56.0 (12.0)	French 11 questions (food frequency) Portions described by weight 5 minutes to complete Unspecified timescale	1 total score derived by summing responses Lower scores indicate greater adherence to diet Cut-offs used to define diets as adherent / non adherent

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Northwest Lipid Research Clinic Fat Intake Score (NWFIS) Retzlaff (1997)[20] USA	Test-retest; validation (n=310)	Work site	90% White American	37.4% women); age=42.3; BMI=27.7; 95.5% high school or greater	English 12 questions (food frequency and behavioural) Portions described by weight 3 minutes to complete Diet over the last month	1 total score derived by summing responses Lower scores indicate lower fat diet Cut offs used to define diets as high / low in fat and cholesterol
Rate Your Plate (RYP) Gans (1993)[15] USA	Validation (n=102)	Primary care	23.5% Portuguese heritage	57.8% women); age=38.1 (13.1); BMI=26.5 (5.9); 83.3% completed high school	English 23 questions (food frequency and behavioural) Portions described by weight No completion time estimated Unspecified timescale	1 total score derived by summing responses Higher scores indicate healthier choices Cut-offs used to define diets as healthy/unhealthy
Total and saturated fat and free sugar						
Dietary Fat and Free Sugar Short Questionnaire (DFFQA) Francis (2013)[69] Australia	i) Validation; internal reliability (n=40) ii) Test-retest (n=29)	Undergraduates	75% Australian	i) 60% women; age=21.3 (5.8); BMI=23.4 (3.4); 100% > high school education ii) Test-retest sample was a subset of validation sample: 62% women	English 26 questions (food frequency) Portions are not described 5 minutes to complete Unspecified timescale	1 total score derived by summing responses 3 subscales can be calculated by summing responses for that category Lower scores indicate lower sugar / fat Suggested cut-off used to define diets as high/low in undesirable foods

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Dietary fats and fibre						
Dietary Instrument for Nutrition Education (DINE) Roe (1994)[5] UK	Validation (n=206)	Work site	"majority white"	38% women; age=44.8 (range, 17-62); BMI=25.7; 66% skilled manual workers	English 29 questions (food frequency) Portions described by household measures, volumes and undefined 'servings' 5 – 10 minutes to complete Unspecified timescale	3 subscale scores ('total fat', 'total fibre', 'unsaturated fat') are derived by summing relevant items Lower scores for fat and unsaturated fat indicate low fat diet Higher scores for fibre indicate high fibre diet Cut-offs used to identify diets as high / low in fat / fibre
Fat and Fibre Barometer (FFB) Wright (2000)[9] Australia	i) Test-retest (n=115) ii) Validation (n=98)	General community/work site	NR	i) 47.8% women; higher than average education ii) Validation sample was a subset of test-retest sample; 52.0% women	English 20 questions (food frequency and behavioural) Portions described by household measures or undescribed 10 minutes to complete Unspecified timescale	1 total score derived by summing responses Higher scores indicate lower fat / higher fibre diet People are encouraged to consider changes in questions where they scored 3 or less

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Fat and Fibre Diet Behaviour Questionnaire (FFDBQ)[18] Shannon (1997) USA	i) Item generation (n ≥200) ii) Validation (n=1795) iii)Test-retest (n=943)	i) "Convenience samples" ii) Primary care	i) NR ii) 93% White American	i) 1 focus group and 2 convenience samples of approximately 100 each; ii) 68.0% women; age = 51.0; 50% college educated iii) Test-retest sample was a subset of validation sample	English 29 questions (behavioural) Portions are not described No completion time estimated Diet over the last 3 months	Total fat score derived by summing relevant responses 5 fat subscale scores can also be calculated Lower scores for fat indicate lower fat diet Total fibre score derived by summing relevant responses 3 fibre subscale scores can also be calculated Higher scores for fibre indicate higher fibre diet
Norwegian SmartDiet Questionnaire[t] (N-Smart) Svilaas (2002)[7] Norway	i) Test-retest; acceptability (n=111) ii) Validation (n=101)	Primary care; work site	NR	i) 60.4% women; age=51 (range, 28-52); BMI=26.5 (4.8) ii) Validation study was a subsample of the test-retest sample; 61.4% women	Norwegian 15 questions (food frequency and behavioural) Portions described by weight 9 minutes to complete Unspecified timescale	1 total score derived by summing responses Lower scores indicate less healthy choices Cut-offs used to define diets as healthy/unhealthy

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Total fat and fruit and vegetables						
Block Fat, Fruit and Vegetable Screeners (B-F&FV) (These questionnaires can be used separately) Block (2000)[6] USA	Validation (n=208)	Work site	65% White American; 22% Asian/ Pacific Islander; 7% Hispanic; 3% African American	64.4% women; age=41	English 17 questions on fat (food frequency) 7 questions on fruit and vegetables (food frequency) Portions are not described 5 minutes to complete Diet over the last year	Fat and fruit and vegetable subscale scores derived by summing relevant items Lower scores for fat indicate lower fat diet Higher scores for fruit and vegetables indicate higher consumption Cut-offs used to identify diets as high / low in fat / fruit and vegetables
Hispanic Fat and Fruit and Vegetable Screeners (H-F&FV) (These questionnaires can be used separately) Wakimoto (2006)[42] USA	i) Item generation (n=70) ii) Acceptability (n='almost' 300) ii) Test-retest (n=93)	General community	100% Hispanic ("primarily" Mexican and Mexican Americans; 91% born in Mexico)	i) NR ii) 51.0% women; 38% aged <30years; 42% < eighth grade education ii) 58.0% women; age=36.5 (14.5)	Spanish (USA and Central America) 16 questions on fat (food frequency) 7 questions on fruit and vegetables (food frequency) Portions are not described 5 minutes to complete Diet over the last months	**Fat screener** 1 total score derived by summing responses Lower scores indicate lower fat diets Cut-offs used to identify diets as high/low fat **Fruit and vegetable screener** Estimated number of fruit and vegetables/day calculated by summing responses and dividing by 7

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Fruit and / or vegetables						
Canadian Fruit and Veg Questionnaire (CFV-Q)[t] Godin (2008)[66] Canada	Validation (n=350)	General community	NR	56.2% women; age=37.2 (11.5); BMI=27.7 (5.6)	French 6 questions (food frequency) Portions described as cups / volumes No completion time estimated Diet over the last week	Estimated number of fruit and vegetables/day calculated by summing servings per week and dividing by 7
Dutch fruit and vegetable questionnaire[t] (D-F&V) Bogers (2004)[19] Netherlands	i) Validation (n=157) ii) Test-retest (n=73)	General community	NR	i) 100% women; age=41.0 (range, 29-40); BMI=24.0 (range, 18.7-35.9); 95% intermediate to high education level ii) Test-retest sample was a subset of the validation sample	Dutch 8 questions (food frequency) Portions described by household measures 2 minute completion time Diet over the last month	Estimated number of fruit and vegetables/day calculated by summing responses and dividing by 7
Five a day screener (5-F&V) 1) Thompson (2000)[17] 2) Kristal (2000)[67] USA	1) Validation (n=436) 2) Validation (n=260)	1) General community 2) Work site	1) NR 2) 89% White American	1) 53.0% women; aged >50 2) 56.9% women; age=42.0 (range, 20-67); 55% had 16 or more years of education	English 7 questions (food frequency) Portions are not described No completion time estimated Diet over the last month	Estimated number of fruit and vegetables/day calculated by summing responses

Table 1: Tool and study characteristics

Tool name **Author, date[(ref)]** **Country**	**Purpose of study[¶] (number of participants)**	**Recruitment setting**	**Ethnicity**	**Sample characteristics** (Age (years) and BMI (kg/m^2) reported as mean values (standard deviation, when available) unless otherwise indicated)	**Tool characteristics (language, number of questions, portion estimates, time to complete, timescale)**	**Test scoring and outcome**
Mainvil Fruit Habits Questionnaire (M-FrHQ) Mainvil (2011)[68] New Zealand	Validation (n=100)	Unemployment training programme	80% European or Other ethnicity; 11% Maori; 9% Pacific, Asian, Middle Eastern, Latin American, African	50% women; age=38.1 (8.1); 45% < high school education; low SES	English 5 questions (food frequency) Portions are not described No completion time estimated Diet over the last month	Estimated number of servings of fruit per day calculated by summing responses
Short Dutch questionnaire to measure fruit and vegetables[t] (SD-F&V) Van Assema (2002)[16] Netherlands	Validation (n=49)	General community	NR	51.0% women; age=45 (range, 21-68); 50% 'low level of education'	Dutch 10 questions (food frequency) Portions are described by household measures No completion time estimated Unspecified timescale	Estimated number of fruit and vegetables/day calculated by summing responses and dividing by 7

NR=Not reported

[1] Validation = calibration against a reference measure

[2]Acceptability encompasses face validity, clarity and ease of use

[t] Translated into English

[¶]Roman numerals indicate where different samples or sub-samples were used during different phases of tool development