

Dietary assessment method	Description	Output	Study design	Advantages	Disadvantages
Quantitative					
Weighed food record Online version e.g.: ASA24, Research Food Diary, FoodNow	Participants weigh and record all food and beverages in real-time Usual duration 3-7 days	Energy, fibre, macronutrients, micronutrients, additional food constituents (depending on food composition data) Food groups Number of meals	Experimental diet interventions Cohort Case control Cross sectional Longitudinal	Most precise measure of recent dietary intake Good agreement with biological dietary biomarkers	Very burdensome for participant, depending on duration Burdensome for researcher May require assessment of inter-observer agreement between coders May require taking photos of food products
Unweighed food record	Participant records estimated quantities of food and beverages in real-time Usual duration 3-7 days	As for weighed food record	As for weighed food record	Measure of recent dietary intake Less burdensome for participant than weighed food record	Burdensome for researcher
24-hour recall Online version e.g.: ASA24, myfood24, Intake24	Food and fluid intake from midnight to midnight day prior collected through structured interview with trained interviewer	As for weighed food record	Cohort Case control Cross sectional Longitudinal	Measure of recent dietary intake Low burden for participant Online versions available Multiple 24-hr recalls demonstrate good agreement with dietary biomarkers Single 24-hr recall acceptable for large observational studies	Greater risk of recall error as not prospective Requires trained interviewer Interviewer bias (data accuracy dependent on interviewer expertise, consistency between interviewers) Single 24-hour recall usually not appropriate due to day-to-day variation in dietary intake

Dietary assessment method	Description	Output	Study design	Advantages	Disadvantages
Semi-quantitative					
Food frequency questionnaire e.g. DQES, AES, Harvard FFQ, EPIC FFQ, Food4Me	Questionnaire that assesses frequency of consumption of individual foods over a long term defined period (usually one year) Most include 80-120 items	Energy, fibre, macronutrients, micronutrients and additional food constituents (dependent on food composition data) Food groups	Experimental Cohort Case control Cross sectional Longitudinal	Accounts for weekly/seasonal variation in intake Useful for assessment of habitual diet Low burden for participant Simple to administer Practical for large scale studies Validated tools available for specific populations and specific nutrients	Time consuming for participant (up to 60 minutes) Requires mathematical skill to calculate intake using frequency categories Infrequently consumed foods may be missed due to fixed food lists Greater risk of under-reporting and error compared with other methods
Diet quality					
Diet quality indices e.g. HDI, HDS, HEI, AHEI, MDS	<i>A priori</i> score measuring overall healthfulness of the diet based on current evidence	Components aggregated to obtain a final score. Higher score indicates better diet quality	Cohort Case control Cross sectional Longitudinal	Accounts for complexity of the diet and interactive effects of dietary factors Many indices validated by relating index score against health outcomes	Majority require nutrient intake assessment (i.e. food record, 24-hour recall or FFQ) for calculating final score
Diet pattern analysis	<i>A posteriori</i> approach Derives patterns using principal components/ exploratory factor analysis or cluster analysis. Patterns such as 'prudent' or 'Western' can be derived	Identifies foods consumed together (principal components analysis) or clusters individuals with differing dietary intakes (cluster analysis)	Cohort Case control Cross sectional Longitudinal	Accounts for complexity of the diet and interactive effects of dietary factors Can be used as a covariate to determine if the effect of a nutrient is independent of the overall dietary pattern	Requires nutrient intake assessment Patterns empirically derived from data not from diet-health evidence Arbitrary decisions required (e.g. food groups, number of factors/clusters to be retained)