

A standardised evaluation of dietary monitoring tools for risk assessment in Europe.

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Background

European countries have traditionally been applying in-house data collection protocols and tools for the collection of food intake data. For a harmonised assessment of dietary exposures, however, there is a necessity to better understand the influence of different dietary assessment tools on the final consumption estimates.

Objectives

To compare results on dietary intakes obtained through assessment tools used in six European surveys based on the same batches of consumption days in a ring-trial using standardised methodology.

Materials and methods

A ring-trial protocol was applied in 24-hour dietary recall and food record methods used in Estonia, Italy, Latvia, Portugal, Spain and Sweden. Ten consumption days including 256 foods, beverages and dietary supplements (with several being reported in repetition) were constructed, standardised and translated to national languages, and were subsequently reported by “subjects” trained to eliminate variability introduced by study participants. Statistical analysis involved the evaluation of the methods’ repeatability and relative accuracy in capturing quantitative as well as qualitative information on dietary intake.

Results/Conclusions

In most, but not all, cases tools adequately recorded items which were repeatedly reported identically. The discrepancies observed revealed inconsistencies in the implementation of study protocols. The methods performed inefficiently in capturing qualitative characteristics of food items (e.g. fat or salt content; additives, cooking methods), indicating that improvements need to be made in the food descriptors used. The relative accuracy of results was practically independent of the number of integrated databases and the variety of available portion measurement aids. Results did not support the assumption that tools with multiple food quantification means may perform better in a dietary survey. Notwithstanding the possibility of unpredicted variance in the “subjects” reports, several sources of uncertainty were identified, with the interviewer and food record keeper being primarily responsible for the inconsistencies observed.

Proportion of characteristics captured by each tool

Categories of product characteristics	Proportion % (n)						
	Tool 1	Tool 2	Tool 3	Tool 4	Tool 5	Tool 6	Tool 7
Source	56.8 (25)	63.6 (28)	59.1 (26)	40.9 (18)	59.1 (26)	36.4 (16)	50.0 (14)
Ingredients	66.7 (4)	83.3 (5)	83.3 (5)	100 (6)	100 (6)	33.3 (2)	100 (4)
Flavour note	36.4 (4)	36.4 (4)	90.9 (10)	63.6 (7)	45.5 (5)	0.0 (0)	14.3 (1)
Fat content	78.6 (11)	21.4 (3)	0 (0)	0 (0)	35.7 (5)	28.6 (4)	88.9 (8)
Sweetening agent	33.3 (3)	66.7 (6)	66.7 (6)	22.2 (2)	33.3 (3)	11.1 (1)	33.3 (2)
Fortification	71.4 (10)	0.0 (0)	35.7 (5)	14.3 (2)	0.0 (0)	42.9 (6)	61.5 (8)
Alcohol content	58.3 (7)	0.0 (0)	41.7 (5)	0.0 (0)	41.7 (5)	100 (12)	100 (6)
Cooking method	55.3 (21)	50.0 (19)	57.9 (22)	5.3 (2)	39.5 (15)	23.7 (9)	72.0 (18)
Preservation technique	82.4 (14)	41.2 (7)	52.9 (9)	64.7 (11)	47.1 (8)	52.9 (9)	72.7 (8)
Packaging Format	46.0 (29)	4.8 (3)	81.0 (51)	15.9 (10)	41.3 (26)	3.2 (2)	58.1 (25)
Packaging Material	59.3 (32)	1.9 (1)	75.9 (41)	0.0 (0)	0.0 (0)	0.0 (0)	82.5 (33)
Production method	100 (4)	50.0 (2)	75.0 (3)	75.0 (3)	0.0 (0)	0.0 (0)	0.0 (0)
Intended use	100 (4)	75.0 (3)	75.0 (3)	25.0 (1)	25.0 (1)	75.0 (3)	100 (2)
Brand name	64.9 (24)	32.4 (12)	86.5 (32)	32.4 (12)	91.9 (34)	16.2 (6)	91.7 (22)