GERMAN FEDERAL INSTITUTE FOR RISK ASSESSMENT

KiESEL – A children´s nutrition survey focusing on risk assessment

KiESEL Kinder-Ernährungsstudie zur Erfassung des Lebensmittelverzehrs

15 YEARS Science in the Service of Humanity

BfR Bundesinstitut für Risikobewertung

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Background

KiESEL is a representative cross-sectional study conducted by the German Federal Institute for Risk Assessment (BfR). The field phase is from 2014 to the end of 2017. KiESEL is a module of KiGGS Wave 2, the German Health Interview and Examination Survey for Children and Adolescents, conducted by the Robert Koch-Institute. The last representative national survey for children of this age group was conducted in 2001/2002 (VELS study). The KiESEL study now provides up-to-date data and the study results will be incorporated in the BfR risk assessments to improve the safety of foods. In this consequence the study design was chosen based on the requirements for dietary exposure assessment. Preliminary results presented here highlight aspects of the study design (selected results of the FFQ and details of the food record) with special importance for use of the survey data in risk assessments.

Method

- KiESEL collected data on the food consumption of 1000 children aged six month up to five years.
- The families used a weighing record documenting all foods and beverages consumed by their children over a total of four days (3 consecutive days and 1 independent day).
- An interviewer measured the height and body weight of the children.
- As a third part, the families filled out a questionnaire about dietary habits of their child and a food propensity questionnaire (FPQ) with focus on special food items.

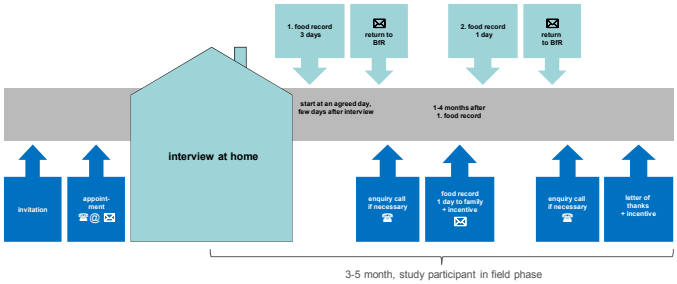

Figure 1: Study design

Exposure related details in the food records

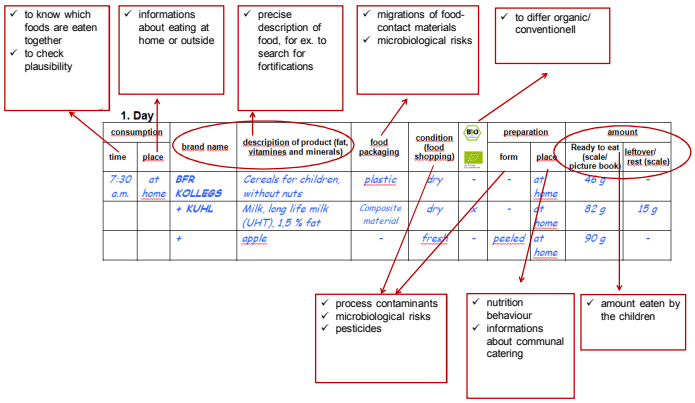

Figure 2: Example of the families' weighing record with all the detailed information of interest (brand name, food packaging, preparation form)

Importance of FPQ information for risk assessment

Preliminary results on seldom eaten food items from the KiESEL food propensity questionnaire (FPQ) are compared to the 24h-recalls of the NVS II and a special survey on seldom eaten foods conducted by BfR (Ehlscheid et al. 2014).

Food items selected here "fish and seafood" (figure 3), "offal" (figure 4) and "game (sausages and meat)" (figure 5) are known to be high in concentration of substances e.g. like heavy metals or dioxins and PCB and therefore of special importance in risk assessments independently of the consumption amounts.

The figures 3-5 show that from the KiESEL-FPQ we get a higher proportion of consumers than the proportion from the 24h-Recalls for all foods shown here. The proportion from the KiESEL-FPQ is smaller than the proportion of the special survey for seldom eaten foods. Only for "tuna (conserve)" and "prawns, crabs, shrimps" the proportion of consumers from the 24h-Recall is visible, that is to say higher than 1%. For the KiESEL FPQ results: cod liver has the smallest proportion (1% of consumers), whereas "tuna (conserve)" and "prawns, crabs, shrimps" have around 35% of consumers. Compared to the 69% and 64%, respectively, of consumers from the special survey on seldom eaten foods where these to groups as well show the highest proportion of consumers.

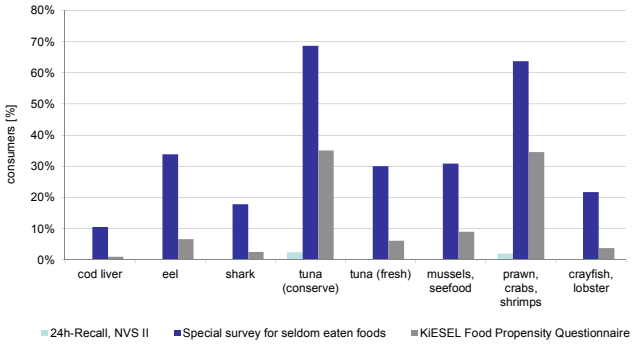

Figure 3: Proportion of consumers eating offal from different animals, comparing results from 24h-recalls (NVS II), Special survey for seldom eaten foods and KiESEL-FPQ

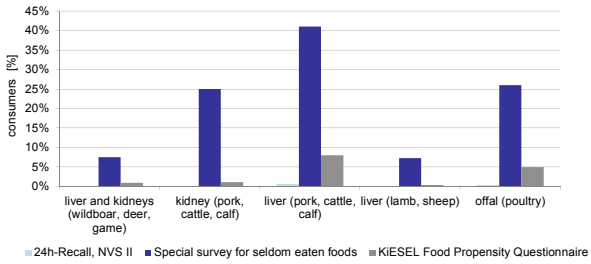

Figure 4: Proportion of consumers eating fish and seafood, comparing results from 24h-recalls (NVS II), Special survey for seldom eaten foods and KiESEL-FPQ

Figure 5: Proportion of consumers eating game (sausages and meat), comparing results from 24h-recalls (NVS II), Special survey for seldom eaten foods and KiESEL-FPQ

For offal, the 24h-Recall results are all lower than 1% whereas the consumer proportion for offal from the Special survey on seldom eaten foods lie between 7 - 41% with the highest proportion for "liver (pork, cattle, calf)". From KiESEL FPQ the results show the highest consumer proportion for "liver (pork, cattle, calf)" as well (8%) and the lowest for "liver (lamb, sheep)" (<1%). Concerning the consumption of "game" 24h-Recall results are lower than 1% whereas the consumer proportion from the Special survey on seldom eaten foods and from KiESEL are 35% and 29%, respectively.

Conclusion

For dietary exposure assessment it is important to have very detailed information of the food and to generate also sound data for special food items such as seldom eaten foods.

The KiESEL food record design permits the collection of very detailed information of the food eaten (i.e. brand names, food packaging, preparation form). This gives a basis for risk assessment concerning substances where consumption information are not very easy to get (i.e. food additives, processing contaminants).

The results show that the additional FPQ information is crucial to avoid underestimation of proportion of consumers eating a specific food on long-term and therefore not to underestimate exposure. By combining information from weighing records, questionnaires on dietary habits and food propensity questionnaires, the results of the KiESEL Study will allow better exposure assessments in particular for seldom eaten foods.

References

NVS II - Max Rubner-Institut (MRI) 2008: Nationale Verzehrsstudie II (NVS II), Ergebnisbericht 1, 2 www.mri.bund.de/NationaleVerzehrsstudie

Ehlscheid et al. (2014) Selten verzehrte Lebensmittel in der Risikobewertung. Ergebnisse einer Telefonbefragung in Deutschland, Proceedings of the German Nutrition Society Vol. 19, S. 100, Abstractband zum 51. Wissenschaftlichen Kongress der Deutschen Gesellschaft für Ernährung (DGE), Paderborn, 12.-14. März 2014 (Postervortrag)

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