

BfR model for pesticide residue intake calculations

BfR Information No. 026/2009, 1 July 2009

For consumer risk assessment, BfR has developed a model to calculate the short-term and long-term intake of pesticide residues. This model is based on consumption data for German children who were older than 2 and younger than 5 years. Children are considered to be a very sensitive subgroup in the population since they have a comparably high food intake combined with a low body weight. Thus children are chosen as representatives for the whole population. The calculation spreadsheet has been updated to bring it into line with the new European MRL (maximum residue level) legislation and to make it easier to use.

1 Background information on the VELS model

The consumption data have been collected in the context of a nationwide consumption survey of food intake by infants and toddlers (the VELS study). This survey was conducted in 2001 and 2002 by the University of Paderborn and was financed by the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV). The data were intended for use in acute pesticide risk assessment.

Details of the underlying calculations in the VELS model have been published in German only but with an English abstract [1]. All equations used in the model comply with the deterministic calculation approach that was jointly developed by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organisation (WHO) for the assessment of pesticide residues. It is widely used on the national and international levels. Consumption data and body weights were derived from the VELS survey. Unit weights were collected and published by Hüther [2]. The default variability factors used in the model comply with the current recommendations of the European Commission. Detailed instructions for the acute risk assessment, especially in the context of surveillance and monitoring samples, were published by Banasiak *et al.* [3].

2 Amendments to version 2.0 of the VELS calculation spreadsheets

The most important amendments in version 2.0 of the VELS calculation spreadsheets are the following:

- the food commodities are now sorted and grouped according to Annex I of Commission Regulation (EC) No 396/2005 [4];
- the consumption figures for commodity groups have been recalculated;
- a new feature for the easy import of EU-MRLs from the EU data base [5] into the spreadsheet has been added;
- entries in the summary sheet are now sorted by intake.

For the calculation of the long-term and short-term intake of pesticide residues by children according to the VELS model and for subsequent acute and chronic risk assessment, BfR provides two Excel spreadsheets:

- VELS_2-0_acute_ENG.xlt
- VELS_2-0_chronic_ENG.xlt

3 References

- [1] Banasiak U, Hesecker H, Sieke C, Sommerfeld C, Vohmann C (2005) Abschätzung der Aufnahme von Pflanzenschutzmittel-Rückständen in der Nahrung mit neuen Verzehrsmengen für Kinder. Bundesgesundheitsblatt – Gesundheitsforschung – Gesundheitsschutz 48: 84-98
- [2] Hüther L, Prüße U, Hohgardt K (2004) Mittlere Gewichte von Obst- und Gemüseerzeugnissen – deutsche Daten zur Abschätzung des von Pflanzenschutzmittel-Rückständen in Lebensmitteln ausgehenden möglichen akuten Risikos. Gesunde Pflanzen 56: 55-60
- [3] Banasiak U, Herrmann M, Hohgardt K, Michalski B, Sieke C (2007) Abschätzung des akuten Risikos durch Pflanzenschutzmittel-Rückstände in Lebensmitteln auf der Basis von Daten aus amtlicher Überwachung und Eigenkontrollen. J. Verbr. Lebensm. 2: 54–60
- [4] Commission Regulation (EC) No 178/2006 of 1 February 2006 amending Regulation (EC) No 396/2005 of the European Parliament and of the Council to establish Annex I listing the food and feed products to which maximum levels for pesticide residues apply (OJ L 29 from 02.02.2006, p. 3)
- [5] EU Pesticides Database, http://ec.europa.eu/sanco_pesticides/public/index.cfm