

Letter to the editor

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European Spice Association, ESA, recommends dehydration factors to assess pesticide residues on products of the spice industry¹

Maximum residue levels (MRLs) for products of plant origin have been set at Community level in Regulation (EC) no. 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin (O.J. L 70 of 16.03.2005). The annexes to this Regulation have been published in several regulations since. They have come into force in September 2008.

Commission Regulation (EC) no. 178/2006 of 1 February 2006 establishes Annex I of Regulation no. 396/2005 listing the food and feed products to which maximum levels for pesticide residues apply. In the Annex to this Regulation, group 2 v), it is defined that MRLs apply to *fresh* herbs. The European spice industry usually trades *dried* herbs.

When assessing the MRLs the pesticide residues found in a dried product have to be put in relation to the fresh product. Article 20 of Regulation 396/2005 permits in the case of dried products (e.g. herbs) the concentration caused by the drying process be taken into account when determining the maximum residue level.

ESA recommends a harmonised pesticide residue assessment

The European Spice Association proposes the application of dehydration factors for dried products (e.g. herbs) in order to have a harmonised MRL assessment. Members of ESA are associations and companies of the spice industry from 15 European countries and Egypt, India, Turkey, Sri Lanka. The dehydration factors mentioned below should be applied in such a way that the pesticide limit fixed in the Regulation for the specific product should be multiplied by the dehydration factor. The result of the multiplication should then be compared with the result of the analysis.

The list does not claim to be complete. It gives some examples. Foodstuffs which have not been listed are subject to dehydration factors relevant for similar foodstuffs mentioned in this list.

Product name	Dehydration factor
basil	7
celery leaves	10
chervil	5
chives	7
coriander leaves	13
dill tops	7
garlic	3
laurel leaves	7
lovage leaves	7
marjoram	7
onion	9
oregano	6
parsley leaves	6
mint	7
capsicums	10
rosemary	7
sage	7
savory herb	7
tarragon	7
thyme	7

The list is also available at the website of ESA (<http://www.esa-spices.org/documents>).

How dehydration factors were derived

The ESA experts have derived the dehydration factors from literature data (see annex) and data from company labs. The experts calculated the relation of dry matter of the fresh herb to the dried product.

The resulting values were checked with the following formula:

$$\text{dehydration factor} = 1/[1-(\%H_2O/100)]$$

A good correlation could be confirmed. This formula has been used by A. Ambrus for the development of dehydration factors for paprika in the framework of the Codex Alimentarius work on pesticide residues (lit. 10).

The experts took also into consideration that different drying processes may result in different dehydration factors. Therefore the dehydration factors are as close to reality as possible representing average values. They are proposed without decimal in order not to pretend a higher accuracy than realistically achievable.

The water content of herbs can vary according to variety and place of origin. Figures proposed are average dehydration factors. Should the dehydration factor proposed in this list not be appropriate for the specific product, the company must document the water content of the fresh product and the derived dehydration factor.

Taking into consideration the different literature data on the moisture content of fresh herbs, which may reflect the

¹ This information has been published in German language in Deutsche Lebensmittel-Rundschau, Heft 10, Oktober 2008.

influence of the sort, the climate conditions of growth, the differences of the drying process, differences in the determination of dry matter ESA believes that the dehydration factors proposed are as close to reality as practically possible.

Difficulties with control labs may be expected

In a presentation the EC Commission recalled that to date 250 pesticides were covered by the 4 existing EC Directives. Besides 850 more pesticide MRLs were set at national level, which summed up to approx. 500.000 plant/pesticide combinations. These have been reduced in the process of harmonisation to approx. 65.000 plant/product combinations in Annex III part A of the Regulation. Together with the Annexes II and III part B one may estimate that approx. 200.000 plant/pesticide combinations are now registered. It seems inevitable that in the course of such an enormous task errors have crept in, which may cause difficulties in future.

ESA has informed its members in India, Turkey and Sri Lanka about the new requirements but this does not guarantee that all growers in the countries of origin apply pesticides according to the new legislation in Europe from the next crop on. Legislators, food control authorities, spice industry, chemical industry, importers and exporters as well as all participants in the food chain are challenged likewise.

Annex: Literatur used to derive the dehydration factors:

- (1) ESA dehydration factors, Working document, June 2003.
- (2) Commission Regulation (EC) No. 178/2006 (...listing the food and feed products to which maximum levels for pesticide residues apply).
- (3) Heseke, H. und Heseke, B. (2005) Die aktuelle Umschau Nährwert- und Kalorientabelle. Umschau.
- (4) Souci, S. W., Fachmann, W., and Kraut, H. (2000) Nährwerttabellen. 6. Auflage. Medpharm Scientific Publishers, CRC Press.
- (5) McCance and Widdowson's (2002) The Composition of Food. 6. Auflage. Food Standard Agency, Institute of Food Research, Royal Society of Chemistry.
- (6) Bundeslebensmittelschlüssel (Official German Register on nutritional Values of Food Products).
- (7) The Proximate Nutritional Composition of Spice. No. 941104. ASTA Technical Bulletin.
- (8) Danish Food Composition Databank. Version 6.0. Danish Institute for Food and Veterinary Research, http://www.fod-comp.dk/fcdb_default.asp.
- (9) internal Data of the companies Fuchs, Kraeuter Mix, Worlee.
- (10) Ambrus, A. (2004) Estimation of Maximum Residue Levels for Pesticides in/on Spices. In: FAO Plant Production and Protection Paper 182/1, Pesticide Residues in Food-2004, Evaluations Part I – Residues, pages 1151+1152.

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