

Goji Berries – A Natural Fruit?

Pesticide Residues in Dried Goji Berries 2009/2010

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INTRODUCTION

Advertisements promise: eat a handful of goji berries daily and you'll stay fit, healthy and young. This so called „anti-aging berry“ from Asia, also known as the wolfberry, has become a trend in western countries. In Europe the red berries are usually sold as dried fruit or goji juice. In some cases they are claimed to be “natural” or “wild-harvested”, which gives the consumer the impression that they grow naturally without the use of chemical synthetic pesticides.

ANALYSIS

In 2009, CVUA Stuttgart analyzed 14 dried goji berry (*Lycium barbarum* and *L. Chinense*) samples for residues of more than 550 different pesticides and metabolites using the QuEChERS method [1]. Given that all the samples surveyed in 2009 (including a sample labelled as organic) contained residues above the MRL for acetamiprid, 26 dried berry samples (mostly originating from China) were analyzed in the first half of 2010 to see whether the residue situation had improved.

Since MRLs are only set for the fresh berries, a processing factor of 5 was used for calculating the residue values, taking into account the effect of drying on the residue concentration.

RESULTS

In 2010, hardly any change in the residue situation was noticed. In total, 38 different pesticides were found. On average, 11 pesticide residues per sample were detected (see Figures 1 and 2).

Among the 26 samples, two were labelled as organic. These met the legal provisions - e.g. only residues <0.01 mg/kg (action level for organic produce) were detected.

However, only two of the 24 conventionally grown samples met the legal requirements. Miscellaneous samples contained more than one legal violation:

- in 83% of the conventionally grown samples MRL violations were found (20 x acetamiprid, 1x chlorothalonil, 1x propargite)
- in 4 samples claims such as “wild-harvested”, “natural” or “residue-free” were misleading to the consumer due to the presence of extensive amounts of pesticide residues
- in 6 samples the labelling was incorrect (1x non-proven health claim, 4x preservation with sulphites was not labelled, 1x nutrition labelling of claimed vitamins was missing)
- in one case forbidden irradiation of the berries was detected

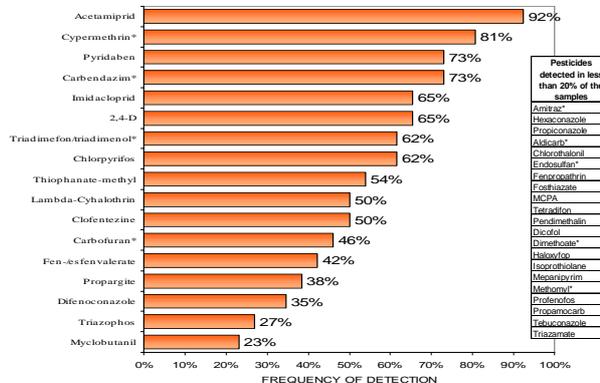


Figure 1 Detection frequency of pesticides; *sum parameter

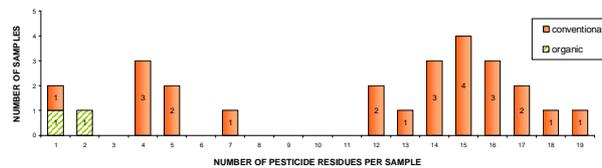


Figure 2 Number of pesticide residues detected per sample

LEGAL AMENDMENTS

In the latest amendment to Annex I of Regulation (EC) No. 396/2005 goji berries are to be grouped with tomatoes as “other products included in the definition to which the same MRL applies” – hence, the MRL for acetamiprid will change from 0.01 mg/kg to 0.1 mg/kg. Thus, when applying the new MRL to our 1020 survey data, only 5 samples would have an acetamiprid MRL violation compared to 20 samples now (see Figure 3).

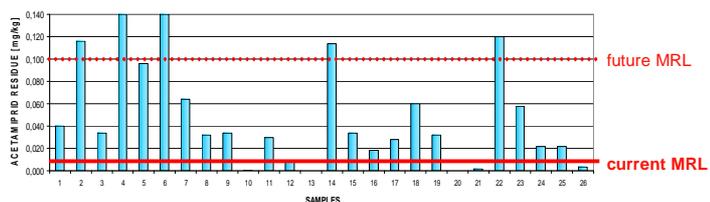


Figure 3 Acetamiprid residues in dried goji berries (values referring to fresh berries); Samples No. 10 and 20 were organic

SUMMARY

Conventionally grown goji berries are often treated extensively with pesticides, even though sometimes claimed otherwise. Only 6 out of 26 samples met the current legal provisions set for pesticide residues. However, due to amendments to Annex I Reg. (EC) No. 396/2005, MRL violations in goji berries will probably be less in future.

LITERATURE

- [1] CEN/TC 275 prEN 15662:2008; Foods of plant origin - Determination of pesticide residues using GC-MS and/or LC-MS/MS following acetonitrile extraction/partitioning and cleanup by dispersive SPE
 [2] BfR-Datensammlung zu Verarbeitungsfaktoren für Pflanzenschutzmittel-Rückstände
www.bfr.bund.de/cd/10196

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