

5.22 PROFENOFOS (171)

RESIDUE AND ANALYTICAL ASPECTS

Profenofos is an organophosphorus insecticide. The mode of action is via the inhibition of the acetylcholinesterase enzyme.

It was first evaluated by the JMPR in 1990 as a new compound. It was re-evaluated in the 2007 JMPR for toxicology and the 2008 JMPR for residues. The 2007 JMPR evaluated profenofos for toxicology under the Periodic Review Programme and recommended the current ADI of 0–0.03 mg/kg bw and ARfD of 1 mg/kg bw.

The 2008 JMPR evaluated profenofos for residue under the Periodic Review Programme and concluded that the definition of residue for compliance with MRL and for dietary risk assessment was profenofos.

Profenofos was re-evaluated by the 2011 and 2015 JMPR for additional uses.

Profenofos was scheduled at the Forty-ninth Session of the CCPR for the evaluation of additional uses in the 2018 JMPR. The current Meeting received residues data for green coffee beans.

Methods of analysis

The Meeting received two new methods for the determination of profenofos in green coffee bean. The two data generation methods involved extraction with methanol followed by sample clean up by SPE. Final determination was achieved using either GC-NPD or LC-MS/MS; the LOQ for profenofos was either 0.01 mg/kg or 0.02 mg/kg respectively.

The Meeting concluded that suitable methods are available for the determination of profenofos in green coffee beans.

For enforcement, a review of the literature demonstrated that residues of profenofos in green coffee beans can be determined using the QuEChERS method with an LOQ of 0.01 mg/kg.

Stability of residues in stored analytical samples

Data were previously evaluated by the 2008 JMPR for crops with high oil content. The Meeting concluded that the demonstrated storage stability for various cotton fractions was sufficient to support the maximum length of storage of the green coffee beans (445 days prior to analysis).

Results of supervised residue trials on crops

The Meeting received residue trials data for profenofos on green coffee beans.

Coffee beans

The critical GAP in Brazil, is for two foliar applications of 400 g ai/ha, a re-treatment interval of 30 days and a PHI of 7 days.

A total of seven supervised residue trials, conducted in Brazil on green coffee beans following normal agricultural practices, supported the critical GAP.

Residues in green coffee beans in rank order (n = 7) were: < 0.01, < 0.01, < 0.01, < 0.02, < 0.02, < 0.02 and 0.02 mg/kg.

The Meeting estimated a maximum residue level of 0.04 mg/kg and a STMR of 0.02 mg/kg for green coffee beans.

RECOMMENDATIONS

On the basis of the data from supervised trials the Meeting concluded that the residue levels listed in Annex 1 are suitable for establishing maximum residue limits and for an IEDI and IESTI assessment.

DIETARY RISK ASSESSMENT

Long-term dietary exposure

The ADI for profenofos is 0–0.03 mg/kg bw. The International Estimated Daily Intakes (IEDIs) for profenofos were estimated for the 17 GEMS/Food Consumption Cluster Diets using the STMR or STMR-P values estimated by the JMPR. The results are shown in Annex 3 of the 2018 JMPR Report. The IEDIs ranged from 0–20% of the maximum ADI.

The Meeting concluded that long-term dietary exposure to residues of profenofos from uses considered by the JMPR is unlikely to present a public health concern.

Acute dietary exposure

The ARfD for profenofos is 1 mg/kg bw. The International Estimate of Short Term Intakes (IESTIs) for profenofos were calculated for the food commodities and their processed commodities for which HRs/HR-Ps or STMRs/STMR-Ps were estimated by the present Meeting and for which consumption data were available. The results are shown in Annex 4 of the 2018 JMPR Report. The IESTI was 0% of the ARfD.

The Meeting concluded that acute dietary exposure to residues of profenofos from the use considered by the present Meeting is unlikely to present a public health concern.