5.35 TRIAZOPHOS (143)

RESIDUE AND ANALYTICAL ASPECTS

Triazophos is an organophosphates insecticide and acaricide and shows broad-spectrum activity against a wide range of insect pests via soil or foliar treatment of crops. Triazophos was first evaluated by the JMPR in 1982 for toxicology and in 1983 for residues and has been evaluated several times since. Triazophos was evaluated within the periodic review programme by the 2002 JMPR for toxicology and by the 2007 JMPR for residues. The 2002 Meeting established an ADI of 0–0.001 mg/kg bw and an ARfD of 0.001 mg/kg bw. The 2007 JMPR confirmed its previous residue definition: *triazophos* (for compliance with the MRL and for estimation of dietary intake). The 2007 JMPR evaluated the triazophos residues in food and withdrew its previous recommendations except for cotton seed, cotton seed oil and soya bean (immature seeds). The 2010 JMPR evaluated additional residue data on rice and soya bean (immature seeds).

The 2010 JMPR Meeting estimated a maximum residue level of 2 mg/kg in/on husked rice (brown rice), and a median residue of 0.421 mg/kg based on 15 trials conducted in China in 2008 and 2009. Triazophos was applied at the target rate of either 3–4 × 0.506 kg ai/ha (ME formulation) or 3–4× 0.45 kg ai/ha (EC formulation) both with PHIs of 28 days. No maximum residue level recommendation could be made because the estimated short-term intake from residues in rice was 260% of the ARfD for children and general population. There was no alternative GAP available. The 2010 JMPR considered that studies on the effect of processing (polishing, cooking, frying) to be desirable as they would enable a more realistic estimation of residue levels in food actually consumed. Triazophos was listed by the Forty-fourth Session of CCPR for the 2013 JMPR for reconsideration of residues in rice.

China submitted processing data for rice, which were evaluated by the present Meeting.

Methods of analysis

The Meeting received a description and validation data for an analytical method of triazophos on processed commodities of rice. The analytical method was based on extraction with acetone and determination of triazophos with GC-FPD. The Meeting considered the method valid in the range 0.003–3.0 mg/kg triazophos in rice grains, husked rice, polished rice and rice bran.

Stability of residues in stored analytical samples

No storage stability data were received for rice or its processed commodities. Storage stability studies were provided to the 2007 Meeting which demonstrated stability of residues in stored samples of cotton fibre, cotton seed, oranges, carrots and soil for a period of up to 24 months. The Meeting agreed that these studies covered storage stability for rice commodities.

Results of supervised residue trials on crops

The 2010 JMPR Meeting estimated a maximum residue level of 2 mg/kg in/on husked rice (brown rice), and a median residue of 0.421 mg/kg based on 15 trials in/on paddy rice conducted in China in 2008 and 2009.

An additional two trials on paddy rice were submitted to the present Meeting. The trials were conducted in China with 2 applications at 0.45 kg ai/ha instead of 3 applications at 0.45 kg ai/ha (cGAP in China). Since the residues were higher compared to the JMPR 2010 data, the Meeting decided to include the mean value per location (3.7 and 4.9 mg/kg) from these trials with the JMPR 2010 data. This resulted in the following dataset: 0.059, 0.059, 0.060, 0.087, 0.13, 0.34, 0.35, 0.42, 0.51, 0.68, 0.76, 0.81, 0.89, 1.0, 1.2, 3.7, 4.9 mg/kg (n=17).

Based on the 17 trials conducted in China, the Meeting estimated a maximum residue level of 7 mg/kg in/on rice grain and a median residue of 0.51 mg/kg. As rice grains (i.e., rice with hulls) are not traded, the Meeting agreed that a maximum residue level recommendation for rice was not appropriate and decided to use the residue values for rice, to estimate maximum residue levels for husked rice and polished rice.

Fate of residues during processing

Information on the fate of triazophos during processing was provided for rice. In the table below, relevant processing factors for this commodity are summarized based on the residue definition of *triazophos*. Hydrolysis studies under cooking conditions or processing studies for cooking of rice were not submitted to the present or previous Meetings.

Using the $STMR_{RAC}$ obtained from triazophos use, the Meeting estimated STMR-Ps for processed commodities as listed below. An HR-P is not required for processed rice commodities.

Commodity	Processing factors (triazophos)	Max level = Max_{RAC}xPF	STMR-P = $STMR_{RAC}$xPF mg/kg
rice grains – husked, dry	0.24 (n=15, mean)	7 × 0.24 = 1.68	0.51 × 0.24 = 0.12
rice grains – polished, dry	0.080 (n=6, median)	7 × 0.080 = 0.56	0.51 × 0.080 = 0.041

The Meeting confirmed its previous recommendation of 2 mg/kg in/on husked rice, and estimated an STMR-P of 0.12 mg/kg.

The Meeting estimated a maximum residue level of 0.6 mg/kg in polished rice and an STMR-P of 0.041 mg/kg.

Residues in animal commodities

The 2007 JMPR concluded that because of the lack of appropriate animal livestock metabolism study, a residue definition for animal products could not be determined and therefore the Meeting could not make use of the results of the feeding studies. Consequently, the residues in animal products derived from the use of triazophos on rice and its processed commodities were not considered by the present Meeting.

RECOMMENDATIONS

On the basis of the data from supervised trials the Meeting concluded that the residue levels listed below are suitable for establishing maximum residue limits and for use in dietary risk assessment.

Definition of residue (for compliance with the MRL and for estimation of dietary intake): *triazophos*.

DIETARY RISK ASSESSMENT

Long-term intake

The International Estimated Daily Intakes (IEDI) of for triazophos was calculated from recommendations for STMRs for raw and processed commodities in combination with consumption data for corresponding food commodities by the 2007, 2010 and 2013 JMPR. The IEDI of in the 13 GEMS/Food cluster diets, based on the estimated STMRs were in the range 1–40% of the maximum ADI of 0.001 mg/kg bw. The 2013 Meeting concluded that the long-term intake of residues of triazophos from uses considered by the 2007, 2010 and 2013 Meeting is unlikely to present a public health concern.

Short-term intake

The International Estimated Short Term Intake (IESTI) for triazophos was calculated for rice and its processed commodities for which maximum residue levels were estimated and for which consumption data were available. For those processed commodities, where no processing data were available, the STMR-P for polished rice was used for rice flour, rice beer and rice wine, while the STMR-P for husked rice was used on all other processed commodities. Since husked rice and polished rice are not consumed raw, but in cooked form and consumption data are available for the cooked form, a default dilution factor of 0.4 was used to compensate for the swelling during cooking. A default dilution factor of 0.04, 0.19 and 0.15 was used on rice milk, rice beer, and rice wine respectively. The results are shown in Annex 4.

The IESTI for rice and its processed commodities and based on the 2012 consumption data and an ARfD of 0.001 mg/kg bw represents 0–130% of the ARfD for cooked husked rice consumption of children of 1–6 years in Japan, and 0–100% of the ARfD for all other processed rice commodities by children or general population.

The Meeting concluded that the short-term intake of residues of triazophos resulting from its uses that have been considered by JMPR might present a public health concern. There was no alternative GAP to be considered and refinement of the dietary risk assessment by using processing factors for husked rice still showed a potential public health concern. Processing studies from rice (husked and polished) are desirable for further refinement of the exposure.

The 2002 Meeting established an ARfD of 0.001 mg/kg bw on the basis of the NOAEL of 0.0125 mg/kg bw per day in the 3-week study in humans and a safety factor of 10. Hence, further refinement is unlikely in the toxicological assessment.