

INTERGOVERNMENTAL GROUP ON TEA
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Working Group on MAXIMUM RESIDUE LEVELS IN BREW1

# Introduction

The pesticide residue problem remains important in the consumption and trade of tea in the world. The amounts of pesticide maximum residue levels (MRL) in tea were increased significantly in recent years. There are more than 1100 pesticide MRLs in tea in EU and more than 800 in Japan. The MRL level established for tea was more and more rigorous in the recent ten years – 91.78 percent of the MRL was less than 0.1 mg/kg in the EU – which is around ten times lower than a period of 20 years from the 1950s to 2010s in the world.

Since 2008, the Working Group on MRLs in Tea Brew of the IGG on Tea has been deliberating on for how to establish the MRLs in tea more scientifically and rationally, and a number of steps have been taken in the past years.

# Activities of the Working Group

According to the investigation conducted in China and India, it was clearly demonstrated that the transfer rate of pesticide from dry tea to tea infusion during the brewing process was closely correlated to the water solubility of pesticides. It was also clearly indicated that the pesticide residues in tea brew is the real and most important figure that should be considered in the risk assessment of pesticide residue for tea drinkers.

A policy issue on the establishment of MRLs in dry tea based on the pesticide residue in tea brew was documented and submitted to the CCPR Secretariat twice.

The first document entitled “Assessment of MRLs for Pesticide Residues in Tea” was prepared by the Working Group on MRLs in Tea Brew in 2010 and submitted to the 43rd CCPR Session (April 2011, in Beijing, China). It was adopted as agenda item 13(b) and disseminated to the delegates of 43rd CCPR. Also, a Side-Bar Meeting was organized by the delegation of the USA, Canada and the UK during the 43rd CCPR Meeting. Mr J. Simrany (USA), Ms Louise Roberge (Canada), Ms Katie Donnelly (UK) and Prof. Chen (China) made separate presentations during the meeting. Around 80 delegates from 10 countries attended the CCPR. The significance of establishing the MRLs in dry tea in consulting with the transfer rate from dry tea to tea brew was discussed. The following extracts of relevant paragraphs 157-160 on the Report of CCPR 43 are reproduced:

“ **ASSESSMENT OF MRLS FOR PESTICIDES IN TEA** (Agenda Item 13b)

157. The Committee was informed that the FAO Intergovernmental Group (IGG) on Tea has proposed to change the risk assessment associated with the establishment of MRLs of pesticides in tea and the analytical methods used to identify the presence of pesticides in tea from leaf to brew, or to pay equal attention to both, the leaf and brew, to provide correct and direct information to consumers as tea was used to make an infusion in water in most cases. The Committee noted that the rationale for this proposal was presented in CX/PR 11/43/16.

158. The JMPR Secretariat noted that transfer of residues into tea infusion is already part of risk assessment and information on standard procedure of testing methodology and relevant scientific studies (in particular processing factor) would be welcome. The Secretariat also advised that MRLs are set on tea leaves, not on tea brew as the leaves are the product commonly and internationally traded.

159. Some delegations informed the Committee that tea was an important crop in their countries and they might submit data and information if requested.

**Conclusion**

160. The Committee emphasized the need for processing studies to refine the dietary risk assessment of tea and supported the comments of the FAO JMPR Secretariat.*”*

Another document entitled “Assessment of MRLs for Pesticides in Tea” was prepared by the Working Group on MRLs in Tea in Brew in 2012 and submitted to the 44th Session of the CCPR (April 2012, Shanghai, China) via the Chinese and Indian delegations. It was adopted as agenda item 12b and CRD 10, 29 and disseminated to the delegates of 44th Session of the CCPR. On 26 April, Prof Chen and Prof. Chaudhuri (India) made the presentation on the importance of using the pesticide residue in tea brew in the establishment of MRLs in tea separately. The recommendation of taking into account the pesticide residue in tea infusion should be considered in the establishment of MRLs in tea was adopted by the CCPR Committee. The results were extracted from paragraph 174-178 of the Report of the 44th Session of the CCPR:

 “**ASSESSMENT OF MRLS FOR PESTICIDES IN TEA** (Agenda Item 12b)

174. The Delegation of China, introducing CRDs 10 and 29, emphasized that tea was a particular commodity whereas the tea infusion as opposed to the leaves was the final product consumed and that pesticide residues in tea infusion were closely related to water solubility of the agrochemicals. Therefore, all standard setting bodies including JMPR, Codex and national regulatory agencies should consider the residue in tea brew or both, in brew and tea leaves, when setting MRLs. In addition, pesticide producers should submit the information on brewing factors of pesticides in tea infusion to JMPR for risk assessment in order to minimize the pesticide residue in the tea infusion and rationalize the application of pesticides in the tea industry.

175. Some delegations questioned whether the current approach to establish MRLs for commodities as they entered in international trade would change for the particular case of tea where the commodity traded were the dried leaves but the MRLs would be based on the tea brew. It was clarified that MRLs for pesticides in tea would be set on the dried tea but the residues in the tea brew should be considered in the establishment of MRLs on dried tea and to that purposes brewing factors for the different pesticides should be taken into account in the dietary risk assessment.

176. The FAO JMPR Secretariat informed the Committee that JMPR had taken into account pesticide residue in tea infusion when brewing factors were provided by countries in the estimation of MRLs for dried tea.

177. Many delegations supported the procedure taken by JMPR in the establishment of MRLs for pesticides in tea. A Delegation proposed that a standard test on how brewing tea was necessary for further consideration by JMPR to better understand the development of brewing factors. In this regard, the Committee was informed that this and other relevant data/information would be provided to JMPR when evaluating MRLs for pesticides in tea.

 **Conclusion**

178. The Committee supported the current procedure of JMPR in the establishment of MRLs for pesticides in tea and encouraged countries to submit relevant data/information on brewing factors and standard methods to JMPR for consideration in estimation of MRLs for pesticides in tea.”

China reported that the 7 000 tea samples collected from 14 tea producing provinces including different tea kinds (black tea, green tea, oolong tea, compressed tea), different tea products (instant tea, ready-to-drink tea) were analyzed by the UPLC/Ms/MS method. The residues of water-soluble pesticides were mainly imidacloprid, acetamicrid, triazophos, dimethoate. The risk assessment of these pesticide residues to tea drinkers was conducted in China. In considering the safety of the tea drinker, a substituting recommendation was put forward in 2011 - 2012. Some safe pesticides with low water solubility were recommended to replace the water pesticides in Chinese tea production. The recommended new pesticides are as follows: chlorfenapyr, thiamethoxam, some botanical insect behavior regulating agents. In 2010/11, field trials on pest control and residue dynamics in China were conducted on approximately 7 000 ha.

In India, a Core Committee was constituted by the Ministry of Commerce and Industry and recommended to the Government to refine the risk assessment for fixation of MRLs in tea taking into consideration ”transfer value” of residue contents in hot water tea brew.

# Action plans

* To generate pesticide residue data for fixation for MRLs in tea based on tea brew for more pesticides used in tea production. This information is recommended to be submitted to the CCPR, JMPR and EU MRLs establishing authorities.
* As discussed and agreed at the CCPR, the MRLs for pesticides in tea would be set on the dried tea but the residues in the tea brew should be considered in the establishment of MRLs on dried tea. It is therefore necessary to set up a recommended procedure on the settings of MRLs in dry tea based on the residue level in tea brew. This recommended procedure would be first discussed at the next session of the IGG on Tea, and then submitted to the CCPR and JMPR for consideration.
* To re-identify the pesticides in tea growing countries according to the insect and disease pest fauna and the residue in dry tea and especially in tea brew and classify into recommended, replaceable and withdrawn pesticides. It is recommended to pay more attention on those high polar pesticides, such as imidacloprid, acetamiprid, triazophos, dimethoate, dichlorvos and methomyl. What is the residue level in dry tea and the transfer rate from dry tea to tea brew during infusion? It is recommended to calculate the in-taking amounts via tea drinking and to undertake the risk assessment to understand the degree of risks.
* To consider the substitution of some pesticides which were proven as unsafe, and recommend new replaceable pesticides which showed high efficiency to target pests, not a persistent feature and low transfer rate from dry tea to tea brew used in tea production after the field trial on the efficacy, residue was conducted and completion of the registration process in tea producing countries.
* To update the priority list on the MRLs generation of pesticides in tea producing countries and recommend to submit this experimental information to the JMPR, and applied to establish the MRLs in tea as a CAC standard.