European Food Safety Authority

EFSA Scientific Report (2009) 330, 1-25

REASONED OPINION OF EFSA

Modification of the existing MRL for lambda-cyhalothrin in globe artichokes[1]

Prepared by the Pesticides Unit (PRAPeR)

(Question No EFSA-Q-2009-00637)

Issued on 15 July 2009

SUMMARY

According to Article 6(2) of the Regulation (EC) No 396/2005, Spain received an application from Syngenta Agro S.A.S. to modify the existing MRL for lambda-cyhalothrin in globe artichokes. In order to accommodate the intended GAP in Spain, the applicant proposes to raise the existing MRL of 0.02 mg/kg (set at the LOQ) to 0.2 mg/kg. Spain as the Evaluating Member State (EMS) drafted an evaluation report according to Article 8 of Regulation (EC) No 396/2005 which was submitted to the European Commission and forwarded to EFSA on 29 May 2009.

EFSA derives the following conclusions regarding the application based on the above mentioned evaluation report and the Draft Assessment Report prepared by Sweden in the framework of the peer review.

The toxicological profile of the active substance was investigated in the peer review and the data were sufficient to conclude on an ADI value of 0.005 mg/kg bw/d and an ARfD value of 0.0075 mg/kg bw.

In the peer review the metabolism of lambda-cyhalothrin was sufficiently elucidated in four crop groups and it was concluded that residue definition for risk assessment and enforcement can be established as lambda-cyhalothrin only. No additional metabolism studies are necessary with regard to globe artichokes. Adequate analytical enforcement methods are available to enforce the proposed MRL in globe artichokes.

Submitted supervised field trials indicate that a higher MRL of 0.2 mg/kg as proposed by the EMS would be necessary to accommodate the intended GAP in Spain. Globe artichokes are not usually grown in crop rotation therefore residue occurrence in rotational crops was not investigated under the current application.

Residues in commodities of animal origin were not assessed in the framework of this application considering that globe artichokes are usually not fed to livestock.

[1] For citation purposes: Reasoned opinion of EFSA prepared by the Pesticides Unit (PRAPeR) on the modification of the existing MRL for lambda-cyhalothrin in globe artichokes. *EFSA Scientific Report* (2009) 330, 1-25

Consumer risk assessment was performed with revision 2 of the EFSA PRIMo. For the chronic intake assessment as input values EFSA used the existing MRLs established in Regulation (EC) No 396/2005 as well as the STMR value as derived for the intended use on globe artichokes. For the refinement of intake calculations for a large number of crops EFSA used STMR values as reported to EFSA by the RMS Sweden in the framework of review of existing MRLs for lambda-cyhalothrin in accordance to Article 12(2) of Regulation (EC) No 396/2009. Acute intake assessment was performed only with regard to globe artichokes and the HR value as derived for the intended use on artichokes was used as an input value in the intake calculation.

No chronic intake concerns were identified for any European diets. Total calculated intake values ranged from 4 - 34% of the ADI. The contribution of globe artichokes to the total dietary intake is insignificant amounting for a maximum of 0.12 % of the ADI for WHO Cluster diet B. No acute intake concerns were identified with regard to artichokes (17.7 % of the ARfD).

Consequently EFSA concludes that the intended use of lambda-cyhalothrin on globe artichokes is acceptable with regard to consumer safety.

Overview of the proposed EC MRLs

Commodity	Existing EC MRL (mg/kg)	Proposed EC MRL (mg/kg)	Justification for the proposal
Enforcement residue definition: lambda-cyhalothrin			
Globe artichokes	0.02*	0.2	The MRL proposal is supported by data and no risk for consumers was identified for the proposed use.

(*): Indicates that the MRL is set at the limit of analytical quantification.

Key words: Lambda-cyhalothrin, globe artichokes, MRL application, Regulation (EC) No 396/2005, consumer risk assessment, pyrethroid insecticides

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BACKGROUND

Regulation (EC) No 396/2005 establishes the rules governing the setting of pesticide MRLs at Community level. Article 6 of that regulation lays down that a party requesting an authorisation for the use of a plant protection product in accordance with Directive 91/414/EEC, shall submit to a Member State, when appropriate, an application to set or modify an MRL in accordance with the provisions of Article 7 of that regulation.

Spain, hereafter referred to as the Evaluating Member State (EMS), received an application from Syngenta Agro S.A.[2] to modify the existing MRL for lambda-cyhalothrin in globe artichokes. This application was notified to the European Commission and EFSA and subsequently evaluated by the EMS in accordance with Article 8 of the Regulation.

After completion, the evaluation report of the EMS was submitted to the European Commission who forwarded the application, the evaluation report and the supporting dossier to EFSA on 29 May 2009. The application was included in the EFSA Register of Questions with the reference number EFSA-Q-2009-00637 and the following subject:

Lambda Cyhalothrin - Application to modify the existing MRL for lambda cyhalothrin in globe artichokes from 0.02 mg/kg to 0.2 mg/kg.

EFSA then proceeded with the assessment of the application as required by Article 10 of the Regulation.

TERMS OF REFERENCE

According to Article 10 of Regulation (EC) No 396/2005, EFSA shall, based on the evaluation report provided by the Evaluating Member State, provide a reasoned opinion on the risks to the consumer associated with the application.

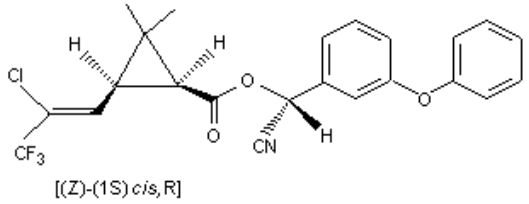
According to Article 11 of that Regulation, the reasoned opinion shall be provided as soon as possible and at the latest within 3 months from the date of receipt of the application. Where EFSA requests supplementary information, the time limit laid down shall be suspended until that information has been provided.

In this particular case the calculated deadline for providing the reasoned opinion is 29 August 2009.

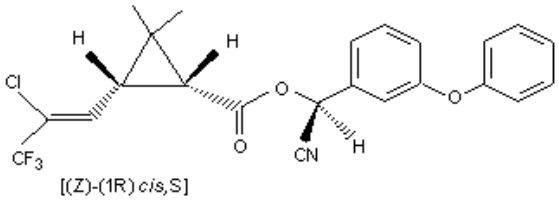
[2]Syngenta Agro S.A., Spain, Ribera del Loira 8-10, 3ª planta, 28042, Madrid, Spain

THE ACTIVE SUBSTANCE AND ITS USE PATTERN

Lambda-cyhalothrin is the ISO common name for *(R+S)*-alpha-cyano-3-(phenoxyphenyl) methyl-*(1S+1R)-cis*-3-(*z*-2-chloro-3,3,3,-trifluoroprop-1-enyl)-2,2-methylcyclopropane-carboxylate (IUPAC). The chemical structure is the following:



[(Z)-(1S) *cis*, R]



[(Z)-(1R) *cis*, S]

Lambda-cyhalothrin is synthetic pyrethroid and lipophilic insecticide. Lambda-cyhalothrin is developed from cyhalothrin and comprises two diastereomers of cyhalothrin which have higher biological activity compared to cyhalothrin.

Lambda-cyhalothrin is a broad spectrum insecticide which is used to control a large number of noxious insects in a wide range of crops in agriculture, horticulture, viticulture, hops, forestry and stored grains. It is highly active against a wide range of species of Lepidoptera, Hemiptera, Diptera, and Coleoptera.

Lambda-cyhalothrin was peer reviewed under Directive 91/414/EEC with Sweden being the designated Rapporteur Member State. Active substance was included in Annex I by Directive 2000/80/EC which entered into force on 29 December 2000. The Annex I inclusion is restricted to use as insecticide. Lambda-cyhalothrin was not peer reviewed by EFSA.

The EC MRLs for lambda-cyhalothrin were first set in Directives 86/362/EEC and 86/363/EEC by Commission Directive 1994/29/EC and in Directive 90/642/EEC by Commission Directive 1994/30/EC. After the entry into force of Regulation (EC) No 396/2005, the MRLs established under Directives 86/362/EEC, 86/363/EEC and 90/642/EEC were transferred to Annex II to Regulation (EC) No 396/2005. In Annex III to the Regulation temporary MRLs were established for crops that were not covered by previous Community MRL legislation. The current MRLs for lambda-cyhalothrin are set in the Annex II and IIIB of Regulation (EC) No 396/2005. The current EC MRL for lambda-cyhalothrin in globe artichokes is set at the LOQ of 0.02 mg/kg. Codex Alimentarius has not established the CXL in globe artichokes.

The GAP for which an authorization is requested in Spain refers to an outdoor use of lambda-cyhalothrin on globe artichokes once or twice at an application rate of 0.009-0.015 g a.s./ha. The minimum waiting period is 3 days. The GAP is summarized in Appendix A.

ASSESSMENT

1. Methods of analysis

1.1. Methods for enforcement of residues in food of plant origin

The enforcement analytical methods for the determination of lambda-cyhalothrin in the foodstuffs of plant origin were evaluated in the framework of the peer review of Directive 91/414/EEC (Sweden, 1996).

For the determination of lambda-cyhalothrin in high water content matrices, various analytical methods (RAM070, RAM081, RAM 081/01, RAM 081/02, RAM 081/05) where determination is performed with GC-ECD or GC-MS are available with the LOQ of 0.01 mg/kg.

In addition, aside from the methods provided by the applicant in the framework of the peer review, laboratories responsible for the official control of MRLs have developed their own methods or have included the active substance in the established multi-methods. In the database developed by the Community Reference Laboratories (CRL) for Residue of Pesticides (www.crl-pesticides.eu) the QuEChERS method is reported to be sufficiently validated at minimum LOQ of 0.005 mg/kg for determination of lambda-cyhalothrin residues in high water content matrices.

Consequently EFSA concludes that adequate analytical methods are available to enforce the proposed MRL in artichokes.

1.2. Methods for enforcement of residues in food of animal origin

No analytical method is required in the framework of this application for food of animal origin since globe artichokes are not used as livestock feed.

2. Mammalian toxicology

Toxicological reference values for lambda-cyhalothrin were derived at Community level during the peer review under Directive 91/414/EEC (European Commission, 2001). Lambda-cyhalothrin is toxic after oral administration and very toxic by inhalation.

Toxicological reference values are summarized in the Table 2-1.

Table 2-1. **Overview of the toxicological reference values**

	Source	Year	Value	Study relied upon	Safety factor
ADI	COM	2001	0.005 (mg/kg bw/d)	1 yr dog	100
ARfD	COM	2001	0.0075 (mg/kg bw)	42 d dog	100

3. Residues

3.1. Nature and magnitude of residues in plant

3.1.1. Primary crops

3.1.1.1. Nature of residues

Under the peer review the metabolism of lambda-cyhalothrin in plants was investigated in the following crops (Sweden, 1996):

-apples (fruits) – application on 10 apples (spotting with C^{14}–cyhalothrin)

-cabbage (leafy vegetables) – application on individual cabbage leaves (spotting with C^{14}–cyhalothrin)

-soya, cotton (pulses and oilseeds) – foliar application 2 x 20 g a.s./ha (soya), 2 x 66 g a.s./ha (cotton)

-wheat (cereals) – foliar application 2 x 220 g a.s./ha

In these studies lambda-cyhalothrin was radiolabelled in three different positions: cyclopropane-, benzyl- or phenyl-labelling. The metabolites formed in plants are a result of ester cleavage. The studies demonstrated that the parent compound lambda-cyhalothrin is the major part of the residues in treated plants and that the metabolic pathway is similar in all crops investigated. The residue in plants for the risk assessment and enforcement is defined as "lambda-cyhalothrin".

Consequently, EFSA concludes that the metabolic pathway of lambda-cyhalothrin in artichokes is sufficiently addressed and no additional metabolism studies are necessary.

3.1.1.2. Magnitude of residues

In support of the proposed GAP, the applicant submitted 4 supervised residue field trials on globe artichokes. All trials were designed as residue decline studies. Residues data are summarized in Table 3-1.

The available studies submitted in the peer review demonstrate storage stability of lambda-cyhalothrin in high water content commodities, high oil content commodities and dry commodities for up to 26 months when stored at <-18°C (Sweden, 1996). Before analysis the supervised field trial samples were stored frozen for up to one year, meaning that the demonstrated storage stability of lambda-cyhalothrin was not exceeded.

According to the EMS, analytical methods used for analyzing supervised residue field trial samples are considered sufficiently validated and fit for purpose.

Submitted supervised residue field trials data indicate that a higher MRL of 0.2 mg/kg in artichokes would be necessary to accommodate the intended GAP in Spain.

Table 3-1. **Overview of the available residues trials data**

Commodity	Region (a)	Outdoor /Indoor	Individual trial results (mg/kg)		STMR (mg/kg) (b)	HR (mg/kg) (c)	MRL proposal (mg/kg)	Median CF (d)	Comments
			Enforcement	Risk assessment					
Residue definition for risk assessment and enforcement: lambda-cyhalothrin									
Globe artichokes	SEU	Outdoor	0.02; 0.03; 0.04; 0.066	0.02; 0.03; 0.04; 0.066	0.035	0.066	0.2	1.0	Rber=0.12 mg/kg Rmax=0.14 mg/kg

(a): NEU, SEU, EU or Import (country code). In the case of indoor uses there is no necessity to differentiate between NEU and SEU.
(b): Median value of the individual trial results according to the enforcement residue definition.
(c): Highest value of the individual trial results according to the enforcement residue definition.
(d): The median conversion factor for enforcement to risk assessment is obtained by calculating the median of the individual conversion factors for each residues trial.

3.1.1.3. Effect of industrial processing and/or household preparation

The effects of the processing on the nature of the residues have not been investigated under the peer review and in the current application (Sweden, 1996).

No processing studies have been submitted with regard to globe artichokes, but such are not considered necessary since the contribution of artichokes to the total dietary intake is insignificant.

3.1.2. Rotational crops

Globe artichokes are not usually grown in crop rotation therefore residue occurrence in rotational crops was not investigated under the current application.

3.2. Nature and magnitude of residues in livestock

Since artichokes are not consumed by livestock and its by-products are not used as feeding stuff, nature and magnitude studies of residues in livestock were not considered in the current application.

4. Consumer risk assessment

Consumer risk assessment was performed with revision 2 of the EFSA PRIMo (Pesticide Residue Intake Model). For the chronic intake assessment EFSA used the existing MRLs as established in Regulation (EC) No 396/2005 as well as the STMR value as derived for the intended use on globe artichokes. In addition, for currants (black, read and white) EFSA used the values as obtained in the previously issued EFSA reasoned opinion on the modification of the existing MRLs for lambda-cyhalothrin (EFSA, 2009). For the refinement of intake calculations for a large number of crops EFSA used STMR values as reported by the RMS Sweden in the PROFile, submitted to EFSA according to Article 12(2) of Regulation (EC) No 396/2009 (Sweden, 2009). Acute intake assessment was performed only with regard to globe artichokes and the HR value as derived for the intended use on artichokes was used as an input value in the intake calculation.

Input values are summarized in Table 4-1.

Table 4-1. **Input values for the consumer risk assessment**

Commodity	Chronic risk assessment		Acute risk assessment	
	Input value (mg/kg)	Comment	Input value (mg/kg)	Comment
Globe artichokes	0.035	STMR	0.066	HR
Citrus fruit	0.01	STMR (edible portion) (Sweden, 2009)	The acute risk assessment was performed only with regard to globe artichokes.	
Pome fruit	0.03	STMR (Sweden, 2009)		
Apricots	0.09	STMR (Sweden, 2009)		
Cherries, peaches	0.03	STMR (Sweden, 2009)		
Plums	0.02	STMR (Sweden, 2009)		

Commodity	Chronic risk assessment		Acute risk assessment	
	Input value (mg/kg)	Comment	Input value (mg/kg)	Comment
Table and wine grapes	0.02	STMR (Sweden, 2009)		
Strawberries	0.045	STMR (Sweden, 2009)		
Raspberries	0.03	STMR (Sweden, 2009)		
Currants (red, black and white)	0.07	STMR (EFSA, 2009)		
Gooseberries	0.035	STMR (Sweden, 2009)		
Table olives	0.11	STMR (Sweden, 2009)		
Bananas	0.035	STMR (Sweden, 2009)		
Mangoes	0.004	STMR (edible portion) (Sweden, 2009)		
Potatoes	0.01	STMR (Sweden, 2009)		
Sweet potatoes, yams	0.01	STMR (Sweden, 2009)		
Beetroot, carrots, horseradish, Jerusalem artichokes, parsnips, parsley root, salsify, swedes, turnips	0.01	STMR (Sweden, 2009)		
Celeriac	0.03	STMR (Sweden, 2009)		
Radishes	0.02	STMR (Sweden, 2009)		
Garlic, onions, spring onions	0.01	STMR (Sweden, 2009)		
Tomatoes	0.01	STMR (Sweden, 2009)		
Peppers	0.02	STMR (Sweden, 2009)		
Aubergines (egg plants)	0.06	STMR (Sweden, 2009)		
Okra, lady`s fingers	0.045	STMR (Sweden, 2009)		
Cucumbers, gherkins, courgettes	0.04	STMR (Sweden, 2009)		
Melons, pumpkins, watermelons	0.01	STMR (Sweden, 2009)		
Sweet corn	0.01	STMR (Sweden, 2009)		
Broccoli, cauliflower	0.045	STMR (Sweden, 2009)		
Brussels sprouts	0.01	STMR (Sweden, 2009)		
Head cabbage	0.05	STMR (Sweden, 2009)		
Chinese cabbage, kale	0.175	STMR (Sweden, 2009)		
Lettuce	0.22	STMR (Sweden, 2009)		
Lamb`s lettuce, scarole, cress	0.33	STMR (Sweden, 2009)		
Spinach, beet leaves	0.195	STMR (Sweden, 2009)		
Herbs	0.33	STMR (Sweden, 2009)		
Beans (with pods)	0.11	STMR (Sweden, 2009)		
Beans (without pods), peas (without pods)	0.01	STMR (Sweden, 2009)		

Commodity	Chronic risk assessment		Acute risk assessment	
	Input value (mg/kg)	Comment	Input value (mg/kg)	Comment
Celery	0.07	STMR (Belgium, 2006)		
Fennel	0.02	STMR (Sweden, 2009)		
Leek	0.095	STMR (Sweden, 2009)		
Pulses (dry)	0.01	STMR (Sweden, 2009)		
Olives for oil production	0.11	STMR (Sweden, 2009)		
Barley, maize, oats, rye, wheat	0.01	STMR (Sweden, 2009)		
Sugar beet (root)	0.01	STMR (Sweden, 2009)		
Tea (dried leaves and stalks, fermented or otherwise of Camellia sinensis)	0.34	STMR (Sweden, 2009)		
Hops (dried)	3.695	STMR (Sweden, 2009)		
Swine, bovine, goat, sheep meet	0.044	STMR (Sweden, 2009)		
Swine, bovine, goat, sheep fat	0.192	STMR (Sweden, 2009)		
Swine, bovine, goat, sheep liver and kidney	0.01	STMR (Sweden, 2009)		
Milk and cream, not concentrated, nor containing added sugar or sweetening matter, butter and other fats derived from milk, cheese and curd	0.01	STMR (Sweden, 2009)		

Summary of intake calculations can be found in Appendix C.

No chronic intake concerns were identified for any European diets. Total calculated intake values ranged from 4 – 34% of the ADI. The contribution of globe artichokes to the total dietary intake is insignificant amounting for a maximum of 0.12 % of the ADI for WHO Cluster diet B.

No acute intake concerns were identified with regard to artichokes (17.7 % of the ARfD).

Consequently EFSA concludes that the intended use of lambda-cyhalothrin on globe artichokes is acceptable with regard to consumer safety.

CONCLUSIONS AND RECOMMENDATIONS

The toxicological profile of the active substance was investigated in the peer review and the data were sufficient to conclude on an ADI value of 0.005 mg/kg bw/d and an ARfD value of 0.0075 mg/kg bw.

In the peer review the metabolism of lambda-cyhalothrin was sufficiently elucidated in four crop groups and it was concluded that residue definition for risk assessment and enforcement can be established as lambda-cyhalothrin only. No additional metabolism studies are necessary with regard to globe artichokes. Adequate analytical enforcement methods are available to enforce the proposed MRL in globe artichokes.

Submitted supervised field trials indicate that a higher MRL of 0.2 mg/kg as proposed by the EMS would be necessary to accommodate the intended GAP in Spain. Globe artichokes are not usually grown in crop rotation therefore residue occurrence in rotational crops was not investigated under the current application.

Residues in commodities of animal origin were not assessed in the framework of this application considering that globe artichokes are usually not fed to livestock.

Consumer risk assessment was performed with revision 2 of the EFSA PRIMo. For the chronic intake assessment as input values EFSA used the existing MRLs established in Regulation (EC) No 396/2005 as well as the STMR value as derived for the intended use on globe artichokes. For the refinement of intake calculations for a large number of crops EFSA used STMR values as reported to EFSA by the RMS Sweden in the framework of review of existing MRLs for lambda-cyhalothrin in accordance to Article 12(2) of Regulation (EC) No 396/2009. Acute intake assessment was performed only with regard to globe artichokes and the HR value as derived for the intended use on artichokes was used as an input value in the intake calculation.

No chronic intake concerns were identified for any European diets. Total calculated intake values ranged from 4 – 34% of the ADI. The contribution of globe artichokes to the total dietary intake is insignificant amounting for a maximum of 0.12 % of the ADI for WHO Cluster diet B. No acute intake concerns were identified with regard to artichokes (17.7 % of the ARfD).

Consequently EFSA concludes that the intended use of lambda-cyhalothrin on globe artichokes is acceptable with regard to consumer safety.

Table 5-1. **Overview of the proposed EC MRLs**

Commodity	Existing EC MRL (mg/kg)	Proposed EC MRL (mg/kg)	Justification for the proposal
Enforcement residue definition: lambda-cyhalothrin			
Globe artichokes	0.02*	0.2	The MRL proposal is supported by data and no risk for consumers was identified for the proposed use.

(*): Indicates that the MRL is set at the limit of analytical quantification.

DOCUMENTATION PROVIDED TO EFSA

1. Evaluation report on the modification of the existing MRL for lambda-cyhalothrin in globe artichokes prepared by Spain under Regulation (EC) No 396/2005. Submitted to EFSA on 29 May 2009.

REFERENCES

EFSA (European Food Safety Authority), 2009. Reasoned opinion of EFSA prepared by the Pesticides Unit (PRAPeR) on the modification of the existing MRL for lambda-cyhalothrin in currant (black, red and white). *EFSA Scientific Report* (2009) 226, 1-26

European Commission, 2001. Review report for the active substance lambda-cyhalothrin. 7572/VI/97-final, January, 2001.

Sweden, 1996. Draft Assessment Report on lambda-cyhalothrin prepared by National Chemicals Inspectorate (KEMI) in the framework of Directive 91/414. June 1996.

Sweden, 2009. Review of all existing MRLs of lambda-cyhalothrin *(EFSA-Q-2008-573)* prepared by Swedish National Food Administration under Article 12 (2) of Regulation (EC) No 396/2005. 10 June 2009.

APPENDIX A – GOOD AGRICULTURAL PRACTICES (GAPS)

Crop and/or situation (a)	F or G (b)	Pest or group of pests controlled (c)	Formulation rate per treatment		Application			Application rate per treatment			PHI (days) (k)	Remarks: (l) *e.g.* minimum realistic PHI
			Type (d-f)	Conc. of a.s. (i)	method, kind , if other than spray (f-h)	growth stage (j)	number (range)	g a.s./ha,	water L/ha	g a.s./hL		
Globe artichoke	F	Aphids and caterpillar	CS	1.5%	Spray	At the beginning of the infection	1-2 (15 day interval)	9.75-15	650-1000	0.975-2.3	3	

(a) For crops, the EU and Codex classifications (both) should be used; where relevant, the use situation should be described (*e.g.* fumigation of a structure).
(b) Outdoor or field use (F), glasshouse application (G) or indoor application.
(c) *e.g.* biting and suckling insects, soil born insects, foliar fungi, weeds.
(d) *e.g.* wettable powder (WP), emulsifiable concentrate (EC), granule (GR).
(e) GCPF Codes – GIFAP Technical Monograph No 2, 1989.
(f) All abbreviations used must be explained.
(g) Method, *e.g.* high volume spraying, low volume spraying, spreading, dusting, drench.
(h) Kind, *e.g.* overall, broadcast, aerial spraying, row, individual plant, between the plant - type of equipment used must be indicated.
(I) g/kg or g/L.
(j) Growth stage at last treatment (BBCH Monograph, Growth Stages of Plants, 1997, Blackwell, ISBN 3-8263-3152-4), including where relevant, information on season at time of application.
(k) Indicate the minimum and maximum number of application possible under practical conditions of use.
(l) PHI – minimum pre-harvest interval.
(m) Remarks may include: extent of use/economic importance/restrictions.

APPENDIX B – EXISTING EC MRLS

Code number	Groups and examples of individual products to which the MRLs apply (a)	Lambda-Cyhalothrin (F) (R)
100000	1. FRUIT FRESH OR FROZEN; NUTS	
110000	(i) Citrus fruit	
110010	Grapefruit (Shaddocks, pomelos, sweeties, tangelo, ugli and other hybrids)	0,1
110020	Oranges (Bergamot, bitter orange, chinotto and other hybrids)	0,1
110030	Lemons (Citron, lemon)	0,2
110040	Limes	0,2
110050	Mandarins (Clementine, tangerine and other hybrids)	0,2
110990	Others	0,02*
120000	(ii) Tree nuts (shelled or unshelled)	0,05*
120010	Almonds	0,05*
120020	Brazil nuts	0,05*
120030	Cashew nuts	0,05*
120040	Chestnuts	0,05*
120050	Coconuts	0,05*
120060	Hazelnuts (Filbert)	0,05*
120070	Macadamia	0,05*
120080	Pecans	0,05*
120090	Pine nuts	0,05*
120100	Pistachios	0,05*
120110	Walnuts	0,05*
120990	Others	0,05*
130000	(iii) Pome fruit	0,1
130010	Apples (Crab apple)	0,1
130020	Pears (Oriental pear)	0,1
130030	Quinces	0,1
130040	Medlar	0,1
130050	Loquat	0,1
130990	Others	0,1
140000	(iv) Stone fruit	
140010	Apricots	0,2
140020	Cherries (sweet cherries, sour cherries)	0,1
140030	Peaches (Nectarines and similar hybrids)	0,2
140040	Plums (Damson, greengage, mirabelle)	0,1
140990	Others	0,1
150000	(v) Berries & small fruit	
151000	(a) Table and wine grapes	0,2
151010	Table grapes	0,2
151020	Wine grapes	0,2
152000	(b) Strawberries	0,5
153000	(c) Cane fruit	
153010	Blackberries	0,02*
153020	Dewberries (Loganberries, Boysenberries, and cloudberries)	0,02*
153030	Raspberries (Wineberries)	0,2
153990	Others	0,02*
154000	(d) Other small fruit & berries	
154010	Blueberries (Bilberries cowberries (red bilberries))	0,02*
154020	Cranberries	0,02*
154030	Currants (red, black and white)	0,1[0.2][a]
154040	Gooseberries (Including hybrids with other ribes species)	0,1
154050	Rose hips	0,02*
154060	Mulberries (arbutus berry)	0,02*
154070	Azarole (mediteranean medlar)	0,02*
154080	Elderberries (Black chokeberry (appleberry), mountain ash, azarole, buckthorn (sea sallowthorn), hawthorn, service berries, and other treeberries)	0,02*
154990	Others	0,02*
160000	(vi) Miscellaneous fruit	
161000	(a) Edible peel	
161010	Dates	0,02*
161020	Figs	0,02*
161030	Table olives	0,5
161040	Kumquats (Marumi kumquats, nagami kumquats)	0,02*
161050	Carambola (Bilimbi)	0,02*

161060	Persimmon	0,02*
161070	Jambolan (java plum) (Java apple (water apple), pomerac, rose apple, Brazilean cherry (grumichama), Surinam cherry)	0,02*
161990	Others	0,02*
162000	(b) Inedible peel, small	0,02*
162010	Kiwi	0,02*
162020	Lychee (Litchi) (Pulasan, rambutan (hairy litchi))	0,02*
162030	Passion fruit	0,02*
162040	Prickly pear (cactus fruit)	0,02*
162050	Star apple	0,02*
162060	American persimmon (Virginia kaki) (Black sapote, white sapote, green sapote, canistel (yellow sapote), and mammey sapote)	0,02*
162990	Others	0,02*
163000	(c) Inedible peel, large	
163010	Avocados	0,02*
163020	Bananas (Dwarf banana, plantain, apple banana)	0,1
163030	Mangoes	0,1
163040	Papaya	0,02*
163050	Pomegranate	0,02*
163060	Cherimoya (Custard apple, sugar apple (sweetsop) , llama and other medium sized Annonaceae)	0,02*
163070	Guava	0,02*
163080	Pineapples	0,02*
163090	Bread fruit (Jackfruit)	0,02*
163100	Durian	0,02*
163110	Soursop (guanabana)	0,02*
163990	Others	0,02*
200000	2. VEGETABLES FRESH OR FROZEN	
210000	(i) Root and tuber vegetables	
211000	(a) Potatoes	0,02*
212000	(b) Tropical root and tuber vegetables	0,02*
212010	Cassava (Dasheen, eddoe (Japanese taro), tannia)	0,02*
212020	Sweet potatoes	0,02*
212030	Yams (Potato bean (yam bean), Mexican yam bean)	0,02*
212040	Arrowroot	0,02*
212990	Others	0,02*
213000	(c) Other root and tuber vegetables except sugar beet	
213010	Beetroot	0,02*
213020	Carrots	0,02*
213030	Celeriac	0,1
213040	Horseradish	0,02*
213050	Jerusalem artichokes	0,02*
213060	Parsnips	0,02*
213070	Parsley root	0,02*
213080	Radishes (Black radish, Japanese radish, small radish and similar varieties)	0,1
213090	Salsify (Scorzonera, Spanish salsify (Spanish oysterplant))	0,02*
213100	Swedes	0,02*
213110	Turnips	0,02*
213990	Others	0,02*
220000	(ii) Bulb vegetables	
220010	Garlic	0,02*
220020	Onions (Silverskin onions)	0,02*
220030	Shallots	0,02*
220040	Spring onions (Welsh onion and similar varieties)	0,05
220990	Others	0,02*
230000	(iii) Fruiting vegetables	
231000	(a) Solanacea	
231010	Tomatoes (Cherry tomatoes,)	0,1
231020	Peppers (Chilli peppers)	0,1
231030	Aubergines (egg plants) (Pepino)	0,5
231040	Okra, lady's fingers	0,1
231990	Others	0,02*
232000	(b) Cucurbits - edible peel	0,1
232010	Cucumbers	0,1
232020	Gherkins	0,1
232030	Courgettes (Summer squash, marrow (patisson))	0,1

232990	Others	0,1
233000	(c) Cucurbits-inedible peel	0,05
233010	Melons (Kiwano)	0,05
233020	Pumpkins (Winter squash)	0,05
233030	Watermelons	0,05
233990	Others	0,05
234000	(d) Sweet corn	0,05
239000	(e) Other fruiting vegetables	0,02*
240000	(iv) Brassica vegetables	
241000	(a) Flowering brassica	0,1
241010	Broccoli (Calabrese, Chinese broccoli, Broccoli raab)	0,1
241020	Cauliflower	0,1
241990	Others	0,1
242000	(b) Head brassica	
242010	Brussels sprouts	0,05
242020	Head cabbage (Pointed head cabbage, red cabbage, savoy cabbage, white cabbage)	0,2
242990	Others	0,02*
243000	(c) Leafy brassica	1
243010	Chinese cabbage (Indian (Chinese) mustard, pak choi, Chinese flat cabbage (tai goo choi), peking cabbage (pe-tsai), cow cabbage)	1
243020	Kale (Borecole (curly kale), collards)	1
243990	Others	1
244000	(d) Kohlrabi	0,02*
250000	(v) Leaf vegetables & fresh herbs	
251000	(a) Lettuce and other salad plants including Brassicacea	
251010	Lamb´s lettuce (Italian cornsalad)	1
251020	Lettuce (Head lettuce, lollo rosso (cutting lettuce), iceberg lettuce, romaine (cos) lettuce)	0,5
251030	Scarole (broad-leaf endive) (Wild chicory, red-leaved chicory, radicchio, curld leave endive, sugar loaf)	1
251040	Cress	1
251050	Land cress	1
251060	Rocket, Rucola (Wild rocket)	1
251070	Red mustard	1
251080	Leaves and sprouts of Brassica spp (Mizuna)	1
251990	Others	1
252000	(b) Spinach & similar (leaves)	0,5
252010	Spinach (New Zealand spinach, turnip greens (turnip tops))	0,5
252020	Purslane (Winter purslane (miner's lettuce), garden purslane, common purslane, sorrel, glassworth)	0,5
252030	Beet leaves (chard) (Leaves of beetroot)	0,5
252990	Others	0,5
253000	(c) Vine leaves (grape leaves)	0,02*
254000	(d) Water cress	0,02*
255000	(e) Witloof	0,02*
256000	(f) Herbs	1
256010	Chervil	1
256020	Chives	1
256030	Celery leaves (fennel leaves , Coriander leaves, dill leaves, Caraway leaves, lovage, angelica, sweet cisely and other Apiacea)	1
256040	Parsley	1
256050	Sage (Winter savory, summer savory,)	1
256060	Rosemary	1
256070	Thyme (marjoram, oregano)	1
256080	Basil (Balm leaves, mint, peppermint)	1
256090	Bay leaves (laurel)	1
256100	Tarragon (Hyssop)	1
256990	Others	1
260000	(vi) Legume vegetables (fresh)	

260010	Beans (with pods) (Green bean (french beans, snap beans), scarlet runner bean, slicing bean, yardlong beans)	0,2
260020	Beans (without pods) (Broad beans, Flageolets, jack bean, lima bean, cowpea)	0,02*
260030	Peas (with pods) (Mangetout (sugar peas))	0,2
260040	Peas (without pods) (Garden pea, green pea, chickpea)	0,2
260050	Lentils	0,02*
260990	Others	0,02*
270000	(vii) Stem vegetables (fresh)	
270010	Asparagus	0,02*
270020	Cardoons	0,02*
270030	Celery	0,3
270040	Fennel	0,3
270050	Globe artichokes	0,02*
270060	Leek	0,3
270070	Rhubarb	0,02*
270080	Bamboo shoots	0,02*
270090	Palm hearts	0,02*
270990	Others	0,02*
280000	(viii) Fungi	
280010	Cultivated (Common mushroom, Oyster mushroom, Shi-take)	0,02*
280020	Wild (Chanterelle, Truffle, Morel ,)	0,5
280990	Others	0,02*
290000	(ix) Sea weeds	0,02*
300000	3. PULSES, DRY	0,02*
300010	Beans (Broad beans, navy beans, flageolets, jack beans, lima beans, field beans, cowpeas)	0,02*
300020	Lentils	0,02*
300030	Peas (Chickpeas, field peas, chickling vetch)	0,02*
300040	Lupins	0,02*
300990	Others	0,02*
400000	4. OILSEEDS AND OILFRUITS	
401000	(i) Oilseeds	0,05*
401010	Linseed	0,05*
401020	Peanuts	0,05*
401030	Poppy seed	0,05*
401040	Sesame seed	0,05*
401050	Sunflower seed	0,05*
401060	Rape seed (Bird rapeseed, turnip rape)	0,05*
401070	Soya bean	0,05*
401080	Mustard seed	0,05*
401090	Cotton seed	0,05*
401100	Pumpkin seeds	0,05*
401110	Safflower	0,05*
401120	Borage	0,05*
401130	Gold of pleasure	0,05*
401140	Hempseed	0,05*
401150	Castor bean	0,05*
401990	Others	0,05*
402000	(ii) Oilfruits	
402010	Olives for oil production	0,5
402020	Palm nuts (palmoil kernels)	0,05*
402030	Palmfruit	0,05*
402040	Kapok	0,05*
402990	Others	0,05*
500000	5. CEREALS	
500010	Barley	0,05
500020	Buckwheat	0,02*
500030	Maize	0,02*
500040	Millet (Foxtail millet, teff)	0,02*
500050	Oats	0,02*
500060	Rice	0,02*
500070	Rye	0,02*
500080	Sorghum	0,02*
500090	Wheat (Spelt Triticale)	0,02*
500990	Others	0,02*
600000	6. TEA, COFFEE, HERBAL INFUSIONS AND COCOA	
610000	(i) Tea (dried leaves and stalks, fermented or otherwise of Camellia sinensis)	1
620000	(ii) Coffee beans	0,05*
630000	(iii) Herbal infusions (dried)	1
631000	(a) Flowers	1
631010	Camomille flowers	1
631020	Hybiscus flowers	1
631030	Rose petals	1
631040	Jasmine flowers	1
631050	Lime (linden)	1

631990	Others	1
632000	(b) Leaves	1
632010	Strawberry leaves	1
632020	Rooibos leaves	1
632030	Maté	1
632990	Others	1
633000	(c) Roots	1
633010	Valerian root	1
633020	Ginseng root	1
633990	Others	1
639000	(d) Other herbal infusions	1
640000	(iv) Cocoa (fermented beans)	0,05*
650000	(v) Carob (st johns bread)	0,05*
700000	7. HOPS (dried) , including hop pellets and unconcentrated powder	10
800000	8. SPICES	0,05*
810000	(i) Seeds	0,05*
810010	Anise	0,05*
810020	Black caraway	0,05*
810030	Celery seed (Lovage seed)	0,05*
810040	Coriander seed	0,05*
810050	Cumin seed	0,05*
810060	Dill seed	0,05*
810070	Fennel seed	0,05*
810080	Fenugreek	0,05*
810090	Nutmeg	0,05*
810990	Others	0,05*
820000	(ii) Fruits and berries	0,05*
820010	Allspice	0,05*
820020	Anise pepper (Japan pepper)	0,05*
820030	Caraway	0,05*
820040	Cardamom	0,05*
820050	Juniper berries	0,05*
820060	Pepper, black and white (Long pepper, pink pepper)	0,05*
820070	Vanilla pods	0,05*
820080	Tamarind	0,05*
820990	Others	0,05*
830000	(iii) Bark	0,05*
830010	Cinnamon (Cassia)	0,05*
830990	Others	0,05*
840000	(iv) Roots or rhizome	0,05*
840010	Liquorice	0,05*
840020	Ginger	0,05*
840030	Turmeric (Curcuma)	0,05*
840040	Horseradish	0,05*
840990	Others	0,05*
850000	(v) Buds	0,05*
850010	Cloves	0,05*
850020	Capers	0,05*
850990	Others	0,05*
860000	(vi) Flower stigma	0,05*
860010	Saffron	0,05*
860990	Others	0,05*
870000	(vii) Aril	0,05*
870010	Mace	0,05*
870990	Others	0,05*
900000	9. SUGAR PLANTS	0,02*
900010	Sugar beet (root)	0,02*
900020	Sugar cane	0,02*
900030	Chicory roots	0,02*
900990	Others	0,02*
1000000	10. PRODUCTS OF ANIMAL ORIGIN- TERRESTRIAL ANIMALS	
1010000	(i) Meat, preparations of meat, offals, blood, animal fats fresh chilled or frozen, salted, in brine, dried or smoked or processed as flours or meals other processed products such as sausages and food preparations based on these	
1011000	(a) Swine	0,5
1011010	Meat	0,5
1011020	Fat free of lean meat	0,5
1011030	Liver	0,5
1011040	Kidney	0,5
1011050	Edible offal	0,5
1011990	Others	0,5
1012000	(b) Bovine	0,5
1012010	Meat	0,5
1012020	Fat	0,5
1012030	Liver	0,5
1012040	Kidney	0,5
1012050	Edible offal	0,5
1012990	Others	0,5
1013000	(c) Sheep	0,5
1013010	Meat	0,5
1013020	Fat	0,5
1013030	Liver	0,5

1013040	Kidney	0,5
1013050	Edible offal	0,5
1013990	Others	0,5
1014000	(d) Goat	0,5
1014010	Meat	0,5
1014020	Fat	0,5
1014030	Liver	0,5
1014040	Kidney	0,5
1014050	Edible offal	0,5
1014990	Others	0,5
1015000	(e) Horses, asses, mules or hinnies	0,5
1015010	Meat	0,5
1015020	Fat	0,5
1015030	Liver	0,5
1015040	Kidney	0,5
1015050	Edible offal	0,5
1015990	Others	0,5
1016000	(f) Poultry -chicken, geese, duck, turkey and Guinea fowl-, ostrich, pigeon	0,02*
1016010	Meat	0,02*
1016020	Fat	0,02*
1016030	Liver	0,02*
1016040	Kidney	0,02*
1016050	Edible offal	0,02*
1016990	Others	0,02*
1017000	(g) Other farm animals (Rabbit, Kangaroo)	0,5
1017010	Meat	0,5
1017020	Fat	0,5
1017030	Liver	0,5
1017040	Kidney	0,5
1017050	Edible offal	0,5
1017990	Others	0,5
1020000	(ii) Milk and cream, not concentrated, nor containing added sugar or sweetening matter, butter and other fats derived from milk, cheese and curd	0,05
1020010	Cattle	0,05
1020020	Sheep	0,05
1020030	Goat	0,05
1020040	Horse	0,05
1020990	Others	0,05
1030000	(iii) Birds' eggs, fresh preserved or cooked Shelled eggs and egg yolks fresh, dried, cooked by steaming or boiling in water, moulded, frozen or otherwise preserved whether or not containing added sugar or sweetening matter	0,02*
1030010	Chicken	0,02*
1030020	Duck	0,02*
1030030	Goose	0,02*
1030040	Quail	0,02*
1030990	Others	0,02*
1040000	(iv) Honey (Royal jelly, pollen)	
1050000	(v) Amphibians and reptiles (Frog legs, crocodiles)	
1060000	(vi) Snails	
1070000	(vii) Other terrestrial animal products	

[a]- MRL proposals as voted in the SCoFCAH on 30-31 March 2009, but is not yet legally adopted by 13 July 2009

*- indicates limit of analytical quantification

APPENDIX C – PESTICIDE RESIDUES INTAKE MODEL (PRIMO)

Lambda-cyhalothrin

Status of the active substance:	**Included**	Code no.	**#N/A**
LOQ (mg/kg bw):		proposed LOQ:	
Toxicological end points			
ADI (mg/kg bw/day):	**0.005**	ARfD (mg/kg bw):	**0.0075**
Source of ADI:	**COM**	Source of ARfD:	**COM**
Year of evaluation:	**2001**	Year of evaluation:	**2001**

Chronic risk assessment - refined calculations

TMDI (range) in % of ADI
minimum - maximum
4 34

No of diets exceeding ADI: ---

Highest calculated TMDI values in % of ADI	MS Diet	Highest contributor to MS diet (in % of ADI)	Commodity / group of commodities	2nd contributor to MS diet (in % of ADI)	Commodity / group of commodities	3rd contributor to MS diet (in % of ADI)	Commodity / group of commodities	pTMRLs at LOQ (in % of ADI)
34.1	NL child	5.9	Milk and cream,	5.9	Milk and milk products: Cattle	3.8	Apples	
28.9	WHO Cluster diet B	4.2	Olives for oil production	1.7	Wheat	1.6	Lettuce	
26.3	DE child	7.2	Apples	2.9	Milk and cream,	2.9	Milk and milk products: Cattle	
26.3	FR toddler	7.9	Milk and cream,	2.8	Spinach	2.4	Beans (with pods)	
24.4	IE adult	4.0	Other leafy brassica	2.6	Other farm animals	1.1	Sheep: Edible offal	
21.8	FR infant	5.1	Milk and cream,	5.1	Milk and cream,	1.9	Beans (with pods)	
19.9	ES child	2.5	Milk and cream,	2.5	Milk and milk products: Cattle	1.8	Lettuce	
19.1	WHO cluster diet E	1.1	Swine: Edible offal	0.8	Other farm animals	0.8	Wheat	
18.4	WHO regional European diet	1.7	Lettuce	1.1	Swine: Meat	1.0	Bovine: Edible offal	
16.9	UK Infant	7.7	Milk and cream,	2.0	Sugar beet (root)	1.0	Bananas	
16.5	WHO cluster diet D	1.8	Other leafy brassica	1.3	Wheat	1.1	Bovine: Edible offal	
15.7	UK Toddler	4.6	Sugar beet (root)	4.1	Milk and cream,	1.0	Apples	
14.9	WHO Cluster diet F	1.3	Lettuce	1.0	Swine: Meat	0.8	Milk and cream,	
14.2	SE general population 90th percentile	2.5	Milk and cream,	2.5	Milk and cream,	1.3	Bananas	
13.3	FR all population	3.8	Other lettuce and other salad plants	1.6	Wine grapes	0.7	Wheat	
13.1	ES adult	2.4	Lettuce	1.0	Milk and cream,	1.0	Milk and milk products: Cattle	
12.6	NL general	1.3	Milk and cream,	1.3	Milk and milk products: Cattle	0.8	Swine: Meat	
11.6	DK child	2.5	Milk and cream,	1.4	Apples	1.3	Cucumbers	
11.3	IT adult	3.2	Other lettuce and other salad plants	1.7	Lettuce	0.8	Wheat	
10.6	IT kids/toddler	2.2	Other lettuce and other salad plants	1.3	Wheat	1.3	Lettuce	
7.4	LT adult	1.1	Apples	0.9	Swine: Meat	0.8	Milk and cream,	
7.1	PT General population	1.1	Potatoes	1.0	Wine grapes	0.8	Wheat	
6.5	UK vegetarian	0.8	Sugar beet (root)	0.7	Milk and cream,	0.6	Lettuce	
6.0	UK Adult	0.8	Sugar beet (root)	0.6	Milk and cream,	0.5	Lettuce	
5.3	DK adult	1.1	Milk and cream,	0.6	Wine grapes	0.5	Bovine: Meat	
4.3	FI adult	1.1	Milk and cream,	0.3	Lettuce	0.2	Potatoes	
4.0	PL general population	1.2	Apples	0.7	Potatoes	0.4	Head cabbage	

Conclusion:
The estimated Theoretical Maximum Daily Intakes (TMDI), based on pTMRLs were below the ADI.
A long-term intake of residues of Lambda-cyhalothrin is unlikely to present a public health concern.

Acute risk assessment /children - refined calculations	Acute risk assessment / adults / general population - refined calculations

The acute risk assessment is based on the ARfD.

For each commodity the calculation is based on the highest reported MS consumption per kg bw and the corresponding unit weight from the MS with the critical consumption. If no data on the unit weight was available from that MS an average European unit weight was used for the IESTI calculation.

In the **IESTI 1** calculation, the variability factors were 10, 7 or 5 (according to JMPR manual 2002), for lettuce a variability factor of 5 was used.

In the **IESTI 2** calculations, the variability factors of 10 and 7 were replaced by 5. For lettuce the calculation was performed with a variabilty factor of 3.

Threshold MRL is the calculated residue level which would leads to an exposure equivalent to 100 % of the ARfD.

Unprocessed commodities

No of commodities for which ARfD/ADI is exceeded (IESTI 1): ---			**No of commodities for which ARfD/ADI is exceeded (IESTI 2):** ---			**No of commodities for which ARfD/ADI is exceeded (IESTI 1):** ---			**No of commodities for which ARfD/ADI is exceeded (IESTI 2):** ---		
IESTI 1	***)**	****)**	**IESTI 2**	***)**	****)**	**IESTI 1**	***)**	****)**	**IESTI 2**	***)**	**)
Highest % of ARfD/ADI	Commodities	pTMRL/ threshold MRL (mg/kg)	Highest % of ARfD/ADI	Commodities	pTMRL/ threshold MRL (mg/kg)	Highest % of ARfD/ADI	Commodities	pTMRL/ threshold MRL (mg/kg)	Highest % of ARfD/ADI	Commodities	pTMRL/ threshold MRL (mg/kg)
17.7	Globe artichokes	0.066 / -	12.6	Globe artichokes	0.066 / -	9.3	Globe artichokes	0.066 / -	6.7	Globe artichokes	0.066 / -
No of critical MRLs (IESTI 1)		---				**No of critical MRLs (IESTI 2)**		---			

Processed commodities

No of commodities for which ARfD/ADI is exceeded: ---				**No of commodities for which ARfD/ADI is exceeded:** ---			
		*****)**				*****)**	
Highest % of ARfD/ADI	Processed commodities	pTMRL/ threshold MRL (mg/kg)		Highest % of ARfD/ADI	Processed commodities	pTMRL/ threshold MRL (mg/kg)	
87.7	Grape juice	0.2 / -		13.4	Orange juice	0.1 / -	
67.9	Apple juice	0.1 / -		10.3	Wine	0.2 / -	
66.0	Orange juice	0.1 / -		8.8	Apple juice	0.1 / -	
47.8	Peach juice	0.2 / -		5.4	Peach preserved with	0.2 / -	
32.0	Raspberries juice	0.2 / -		2.5	Tomato (preserved-	0.1 / -	

*) The results of the IESTI calculations are reported for at least 5 commodities. If the ARfD is exceeded for more than 5 commodities, all IESTI values > 90% of ARfD are reported.

**) pTMRL: provisional temporary MRL

***) pTMRL: provisional temporary MRL for unprocessed commodity

Conclusion:

For Lambda-cyhalothrin IESTI 1 and IESTI 2 were calculated for food commodities for which pTMRLs were submitted and for which consumption data are available.
No exceedance of the ARfD/ADI was identified for any unprocessed commodity.

For processed commodities, no exceedance of the ARfD/ADI was identified.

GLOSSARY / ABBREVIATIONS

a.s.	active substance
ADI	acceptable daily intake
ARfD	acute reference dose
BBCH	Federal Biological Research Centre for Agriculture and Forestry (Germany)
bw	body weight
CAC	Codex Alimentarius Commission
CF	conversion factor for enforcement residue definition to risk assessment residue definition
CIPAC	Collaborative International Pesticide Analytical Council Limited
CS	capsule suspension
CXL	codex maximum residue limit
d	day
DAR	Draft Assessment Report (prepared under Directive 91/414/eec)
DAT	days after treatment
DM	dry matter
DT_{90}	period required for 90 percent dissipation (define method of estimation)
dw	dry weight
EC	European Community
ECD	electron capture detection
EFSA	European Food Safety Authority
EMS	Evaluating Member State
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
GAP	good agricultural practice
GC	gas chromatography
ha	hectare
hL	hectolitre
HPLC	high performance liquid chromatography
HR	highest residue
ILV	independent laboratory validation
ISO	International Organization for Standardization

IUPAC	International Union of Pure and Applied Chemistry
K_{oc}	organic carbon adsorption coefficient
L	litre
LOD	limit of detection
LOQ	limit of quantification
MRL	maximum residue limit
MS	Member States
NEU	Northern European Union
PF	processing factor
PHI	pre harvest interval
ppm	parts per million (10^{-6})
PRIMo	Pesticide Residues Intake Model
PROFile	Pesticide Residues Overview File
RMS	Rapporteur Member State
SEU	Southern European Union
STMR	supervised trials median residue
TMDI	theoretical maximum daily intake
TRR	total radioactive residue
UVD	ultra-violet detection