Modification of the existing maximum residue levels for isofetamid in tomatoes, peppers, aubergines, okra and cucurbits with edible peel

European Food Safety Authority (EFSA), Alba Brancato, Daniela Brocca, Luis Carrasco Cabrera, Chloe De Lentdecker, Lucien Ferreira, Luna Greco, Samira Jarrah, Dimitra Kardassi, Renata Leuschner, Christopher Lythgo, Paula Medina, Ileana Miron, Tunde Molnar, Alexandre Nougadere, Ragnor Pedersen, Hermine Reich, Angela Sacchi, Miguel Santos, Alois Stanek, Juergen Sturma, Jose Tarazona, Anne Theobald, Benedicte Vagenende and Laura Villamar-Bouza

Abstract

In accordance with Article 6 of Regulation (EC) No 396/2005, the applicant ISK Biosciences Europe N.V. submitted a request to the competent national authority in Belgium, to modify the existing maximum residue levels (MRL) for the active substance isofetamid in tomatoes, sweet peppers/bell peppers, aubergines/eggplants, okra/lady’s fingers and the whole subgroup of cucurbits with edible peel. The data submitted in support of the request were found to be sufficient to derive MRL proposals for the commodities under evaluation. Adequate analytical methods for enforcement are available to control the residues of isofetamid in the commodities under consideration at the validated limit of quantification (LOQ) of 0.01 mg/kg. Based on the risk assessment results, EFSA concluded that the short-term and long-term intake of residues resulting from the use of isofetamid according to the reported agricultural practices is unlikely to present a risk to consumer health. The reliable end points appropriate for use in regulatory risk assessment are presented.

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Keywords: isofetamid, various crops, pesticide, MRL, consumer risk assessment

Requestor: European Commission
Question number: EFSA-Q-2018-00070
Correspondence: pesticides.mrl@efsa.europa.eu
Suggested citation: EFSA (European Food Safety Authority), Brancato A, Brocca D, Carrasco Cabrera L, De Lentdecker C, Ferreira L, Greco L, Jarrah S, Kardassi D, Leuschner R, Lythgo C, Medina P, Miron I, Molnar T, Nougadere A, Pedersen R, Reich H, Sacchi A, Santos M, Stanek A, Sturma J, Tarazona J, Theobald A, Vagenende B, and Villamar-Bouza L, 2018. Reasoned Opinion on the modification of the existing maximum residue levels for isofetamid in tomatoes, peppers, aubergines, okra and cucurbits with edible peel. EFSA Journal 2018;16(5):5264, 24 pp. https://doi.org/10.2903/j.efsa.2018.5264

ISSN: 1831-4732

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Summary

In accordance with Article 6 of Regulation (EC) No 396/2005, ISK Biosciences Europe N.V. submitted an application to the competent national authority in Belgium (evaluating Member State, EMS) to modify the existing maximum residue levels (MRLs) for the active substance isofetamid in tomatoes, sweet peppers/bell peppers, aubergines/eggplants, okra/lady's fingers and the whole subgroup of cucurbits with edible peel. Belgium drafted an evaluation report in accordance with Article 8 of Regulation (EC) No 396/2005, which was submitted to the European Commission and forwarded to the European Food Safety Authority (EFSA) on 25 January 2018. To accommodate for the intended uses of isofetamid, the EMS proposed to raise the existing MRLs from the limit of quantification (LOQ; 0.01 mg/kg) to 1.5 mg/kg for tomatoes and aubergines/eggplants, 3 mg/kg for sweet peppers/bell peppers and okra/lady’s fingers, and 1 mg/kg for the whole subgroup of cucurbits with edible peel.

EFSA assessed the application and the evaluation report as required by Article 10 of the MRL regulation. EFSA identified points which needed further clarification, which were requested from the EMS. On 21 March 2018, the EMS submitted a revised evaluation report, which replaced the previously submitted evaluation report. Based on the conclusions derived by EFSA in the framework of the European Union (EU) peer review under Regulation (EC) No 1107/2009 and the additional data provided by the EMS in the framework of this application, the following conclusions are derived.

The metabolism of isofetamid following foliar application was investigated in crops belonging to the groups of fruit crops, leafy crops, pulses/oilseeds. Studies investigating the effect of processing on the nature of isofetamid (hydrolysis studies) demonstrated that the active substance is stable. In rotational crops, parent isofetamid was detected in lower amounts and proportions than in primary crops and the residues mainly composed of the metabolites GPTC and GPTC-malonyl. Overall, the peer review concluded that the metabolic pathways in rotational crops are similar to those observed in primary crops.

Based on the metabolic pattern identified in metabolism studies, the results of hydrolysis studies, the toxicological significance of metabolites and/or degradation products and the capabilities of enforcement analytical methods, the following residue definitions were proposed: plant residue for risk assessment: sum of isofetamid and metabolite GPTC, expressed as isofetamid; residue definition for enforcement: isofetamid. These residue definitions are applicable to primary crops, rotational crops and processed products.

EFSA concluded that for the crops assessed in this application, metabolism of isofetamid in primary and in rotational crops and the possible degradation in processed products have been sufficiently addressed and that the previously derived residue definitions are applicable.

Sufficiently validated analytical methods based on liquid chromatography with tandem mass spectrometry (LC-MS/MS) are available to quantify residues in the crops assessed in this application according to the enforcement residue definition. The methods enable quantification of residues at or above 0.01 mg/kg in the crops assessed (LOQ).

The available residue trials are sufficient to derive MRL proposal for the commodities under evaluation.

Processing studies with tomatoes were submitted in the present MRL application; however, the number of studies was insufficient to derive robust-processing factors.

The occurrence of isofetamid residues in rotational crops was investigated in the framework of the EU pesticides peer review. The available field rotational crop study was underdosed in comparison with the proposed uses under consideration, and the results cannot be scaled because the residues levels were at or below the LOQ. However, based on the available information on the nature and magnitude of residues, it was concluded that significant residues are not expected in succeeding crops, provided that the active substance is applied according to the proposed good agricultural practice (GAP).

Residues of isofetamid in commodities of animal origin were not assessed since the crops under consideration in this MRL application are normally not fed to livestock.

The toxicological profile of isofetamid was assessed in the framework of the EU pesticides peer review under Regulation (EC) No 1107/2009 and the data were sufficient to derive an acceptable daily intake (ADI) of 0.02 mg/kg body weight (bw) per day and an acute reference dose (ARFD) of 1 mg/kg bw. The toxicological reference values for isofetamid are considered to be applicable to the metabolite GPTC included in the risk assessment residue definition.

The consumer risk assessment was performed with revision 2 of the EFSA Pesticide Residues Intake Model (PRIMO). The estimated short-term exposure did not exceed the ARFD for any of the crops assessed in this application. The estimated long-term dietary intake was in the range from 2% to 20% of the ADI.
EFSA concluded that the proposed uses of isofetamid on tomatoes, peppers, aubergines, okra and cucurbits with edible peel will not result in a consumer exposure exceeding the toxicological reference values and therefore is unlikely to pose a risk to consumers’ health.

EFSA proposes to amend the existing MRLs as reported in the summary table below.

Full details of all end points and the consumer risk assessment can be found in Appendices B–D.

| Code^(a) | Commodity                          | Existing EU MRL (mg/kg) | Proposed EU MRL (mg/kg) | Comment/justification                                                                 |
|---------|-----------------------------------|-------------------------|-------------------------|--------------------------------------------------------------------------------------|
| 0231010 | Tomatoes                          | 0.01*                   | 1.5                     | The submitted data are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0231020 | Sweet peppers/bell peppers        | 0.01*                   | 3                       | The submitted data are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0231030 | Aubergines/eggplants              | 0.01*                   | 1.5                     | The submitted data on tomatoes are sufficient to derive a CMRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0231040 | Okra/lady’s fingers               | 0.01*                   | 3                       | The submitted data on peppers are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0232000 | Cucurbits with edible peel        | 0.01*                   | 1                       | The submitted data on cucumbers are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |

EU MRL: European Union maximum residue level.
*Indicates that the MRL is set at the limit of analytical quantification (LOQ).
(a): Commodity code number according to Annex I of Regulation (EC) No 396/2005.
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Assessment

The detailed description of the intended uses of isofetamid in tomatoes, peppers, aubergines, okra and cucurbits with edible peel, which are the basis for the current maximum residue level (MRL) application, is reported in Appendix A.

Isofetamid is the ISO common name for \( N\{1,1\text{-dimethyl-2-(4-isopropoxy-o-tolyl)-2-oxoethyl}\}\}3-methylthiophene-2-carboxamide (IUPAC). The chemical structures of the active substance and its main metabolites are reported in Appendix E.

Isofetamid was evaluated in the framework of Regulation (EC) No 1107/2009 with Belgium designated as rapporteur Member State (RMS) for the representative uses as field uses on peaches, plums, apricots, cherries, grapes, strawberries, lettuces and oilseed rapes and glasshouse uses on strawberries and lettuces. The draft assessment report (DAR) prepared by the RMS has been peer reviewed by European Food Safety Authority (EFSA) (EFSA, 2015). Isofetamid was approved for the use as fungicide on 15 September 2016. The process of renewal of the first approval has not yet been initiated.

The European Union (EU) MRLs for isofetamid are established in Annexes II of Regulation (EC) No 396/2005. The review of existing MRLs according to Article 12 of Regulation (EC) No 396/2005 (MRL review) has not yet been completed. There are currently no Codex Maximum Residue Limits (CXLs) for isofetamid available yet, although draft CXLs were discussed at the 49th Codex Committee for Pesticides Residues (CCPR) meeting in 2017. The proposed Regulation transposing CXLs, for which the EU had not reserved its position in the CCPR, into EU legislation has not yet been published.

EFSA based its assessment on the evaluation report submitted by the EMS (Belgium, 2017), the draft DAR (and its addendum) (Belgium, 2014, 2015) prepared under Regulation (EC) 1107/2009, the Commission review report on isofetamid (European Commission, 2016) and the conclusion on the peer review of the pesticide risk assessment of the active substance isofetamid (EFSA, 2015).

For this application, the data requirements established in Regulation (EU) No 544/2011 and the guidance documents applicable at the date of submission of the application to the EMS are applicable (European Commission, 1997a-g, 2000, 2010a,b, 2017; OECD, 2008, 2011). The assessment is performed in accordance with the legal provisions of the Uniform Principles for the Evaluation and the Authorisation of Plant Protection Products adopted by Commission Regulation (EU) No 546/2011.

As the review of the existing MRLs under Article 12 of Regulation 396/2005 is not yet finalised, the conclusions reported in this reasoned opinion should be taken as provisional and might need to be reconsidered in the light of the outcome of the MRL review.

A selected list of end points of the studies assessed by EFSA in the framework of the this MRL application, review, including the end points of relevant studies assessed previously, submitted in support of the current MRL application, are presented in Appendix B.

The evaluation report submitted by the EMS (Belgium, 2017; as revised in March 2018) and the exposure calculations using the EFSA Pesticide Residues Intake Model (PRIMo) are considered as supporting documents to this reasoned opinion and, thus, are made publicly available as background documents to this reasoned opinion.

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1 Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC. OJ L 309, 24.11.2009, p. 1–50.
2 Commission Implementing Regulation (EU) 2016/1425 of 25 August 2016 approving the active substance isofetamid in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market, and amending the Annex to Commission Implementing Regulation (EU) No 540/2011. OJ L 231, 26.8.2016, p. 30–33.
3 Regulation (EC) No 396/2005 of the Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC. OJ L 70, 16.03.2005, p. 1–16.
4 Commission Regulation (EU) No 544/2011 of 10 June 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards the data requirements for active substances. OJ L 155, 11.6.2011, p. 1–66.
5 Commission Regulation (EU) No 546/2011 of 10 June 2011 implementing Regulation (EC) No 1107/2009 of the European Parliament and of the Council as regards uniform principles for evaluation and authorisation of plant protection products. OJ L 155, 11.6.2011, p. 127–175.
1. Residues in plants

1.1. Nature of residues and methods of analysis in plants

1.1.1. Nature of residues in primary crops

The metabolism of isofetamid in primary crops belonging to the group of fruit crops, leafy crops and pulses/oilseeds following foliar application has been investigated in the framework of the EU pesticides peer review (EFSA, 2015). In all plant matrices, isofetamid was by far the major component of the residues, accounting for 18–73% of the total radioactive residues (TRR), except in bean seeds at harvest where isofetamid was only 1% of the TRR and the residues mainly composed of polar fractions representing all 22–51% TRR. In addition, metabolite GPTC was observed up to 10% TRR in grape and lettuce, all other identified metabolites being below 7% TRR. The metabolic pathway was seen to be similar in the three plant groups (EFSA, 2015). For the intended use, the metabolic behaviour in primary crops is sufficiently addressed.

1.1.2. Nature of residues in rotational crops

Isofetamid is proposed to be used on several crops that can be grown in rotation with other crops. According to the soil degradation studies evaluated in the framework of the peer review, the DT$_{90}$ value of isofetamid ranged from 96 to 174 days (EFSA, 2015). The trigger value of 100 days was exceeded, and therefore, studies investigating the nature and magnitude of residues in rotational crops are required. In the confined rotational crop studies assessed in the framework of the peer review, parent isofetamid was detected in lower amounts and proportions than in primary crops and the residues mainly composed of the metabolites GPTC and GPTC-malonyl, accounting together up to ca 40% TRR in carrot roots and up to ca 60% TRR in lettuce at the 120-day plant back interval (EFSA, 2015). Overall, the peer review concluded that the metabolic pathways in rotational crops are similar to those observed in primary crops. For the proposed uses assessed in the present application, no further information is required.

1.1.3. Nature of residues in processed commodities

The effect of processing on the nature of isofetamid was investigated in the framework of the EU pesticides peer review (EFSA, 2015). The available hydrolysis studies showed that isofetamid is hydrolytically stable under standard processing conditions representative of pasteurisation, boiling/cooking and sterilisation. The metabolite GPTC, included together with isofetamid in the plant residue definition for risk assessment, is a glucoside conjugate of isofetamid, and therefore, possible hydrolytic decomposition of GPTC to the aglycone is covered by the available hydrolysis studies on isofetamid.

1.1.4. Methods of analysis in plants

Analytical methods for the determination of residues of isofetamid and the metabolite GPTC in food/feed of plant origin were assessed during the EU pesticides peer review (EFSA, 2015). The methods allow for the quantification of residues at or above the limit of quantification (LOQ) of 0.01 mg/kg for each analyte in crops belonging to the high water content, high acid content and dry groups of commodities; however, the methods were not validated for residues in high oil content commodities (Belgium, 2014). The methods are sufficiently validated for residues of isofetamid and the metabolite GPTC in the crops under consideration in the present MRL application.

1.1.5. Stability of residues in plants

The storage stability of isofetamid and the metabolite GPTC in plants stored under frozen conditions was investigated in the framework of the EU pesticides peer review (EFSA, 2015). It was demonstrated that for the crops assessed in the framework of this application, residues were stable for at least 12 months when stored at –20 °C.
1.1.6. Proposed residue definitions

Based on the metabolic pattern identified in metabolism studies, the results of hydrolysis studies, the toxicological significance of metabolites and/or degradation products and the capabilities of enforcement analytical methods, the following residue definitions were proposed:

- plant residue for risk assessment: sum of isofetamid and metabolite GPTC, expressed as isofetamid
- residue definition for enforcement: isofetamid

The same residue definitions are applicable to rotational crops and processed products. The residue definition for enforcement set in Regulation (EC) No 396/2005 is identical with the above-mentioned residue definition. Taking into account the proposed use assessed in this application, EFSA concluded that no further information is required.

1.2. Magnitude of residues in plants

1.2.1. Magnitude of residues in primary crops

In support of the MRL application, the applicant submitted four residue trials and four residue decline trials each for tomatoes, peppers and cucumbers. The trials were conducted under greenhouse conditions in Italy, the Netherlands and Spain and were performed with two foliar spray applications after formation of the edible parts at a nominal rate of 480 g a.s./ha with an application interval of 7–10 days, whereas the critical good agricultural practices (GAPs) for the intended uses are a minimum application interval of 7 days.6 That the application interval in a number of residue trials is longer than the application interval in the critical GAPs is a source of additional uncertainty in the MRL calculations and in the risk assessment; however, this deficiency in the residues trials data is judged to be a minor deviation which is expected to have no material impact on the results of the MRL calculation or the risk assessment.

For tomatoes, the residue trials and the residue decline trials were conducted with half of the trials performed on standard-sized varieties and half of the trials performed on cherry tomato varieties. The applicant proposed to extrapolate the results of the residue trials performed on tomatoes to aubergines, to extrapolate the results of the residue trials on peppers to okra and to extrapolate the results of the residue trials on cucumbers to the whole subgroup of cucurbits with edible peel, in accordance with the EU extrapolation rules (European Commission, 2017). Overall, the trials are considered sufficiently representative of the GAPs for the intended uses on the crops under consideration.

The residue trial samples were stored under conditions for which integrity has been demonstrated. The samples were analysed for the parent compound and the metabolite GPTC, in accordance with the requirements of the residue definitions for enforcement (isofetamid only) and risk assessment (isofetamid and GPTC). According to the assessment of the EMS, the methods used were sufficiently validated and fit for purpose. The levels of metabolite GPTC were below the LOQ in all residue trials samples, and therefore, the LOQ value of 0.01 mg/kg was used in calculations of the supervised trials median residue (STMR) and highest residue (HR) values for risk assessment purposes. The residues data from the supervised residue trials in primary crops are summarised in Appendix B.1.2.1.

1.2.2. Magnitude of residues in rotational crops

The possible transfer of isofetamid residues to crops that are grown in crop rotation has been assessed in EU pesticides peer review (EFSA, 2015). The available field rotational crop studies demonstrated that no significant residues (residues of isofetamid and GPTC below 0.01 mg/kg and residues of GPTC-malonyl at or below 0.02 mg/kg) are expected in the edible parts of succeeding crops (spinach, radish and winter barley) planted in soil following foliar applications to primary crop (lettuce) treated at 2 × 400 g a.s./ha (Belgium, 2014). The total seasonal application rate for the crops under consideration is 960 g a.s./ha, and therefore, the field rotational crop study was underdosed (0.83N) and the results cannot be scaled because the residues levels were at or below the LOQ. However, considering the total seasonal application rates for the proposed uses (GAPs) and that the levels of residues observed in the field rotational crop study were not only below the LOQ

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6 The application intervals in the residue trials (and number of trials) were, for tomatoes 7 days (n=5) or 10 days (n=3); for peppers 7 days (n=3), 8 days (n=3), 9 days (n=1) or 10 days (n=1); and for cucumbers 7 days (n=3), 8 days (n=4) or 10 days (n=1).
(0.01 mg/kg) but, in most instances, also below the limit of detection (LOD) (0.004 mg/kg), it was concluded that significant residues are not expected to occur in succeeding crops, provided that the active substance is applied according to the proposed GAPs.

1.2.3. Magnitude of residues in processed commodities

Processing studies in grapes were assessed in EU pesticides peer review and processing factors were derived for wine, juice and raisin (EFSA, 2015). Two processing studies (one balance and one follow-up) with tomatoes were submitted in the present MRL application which indicate that drying of tomatoes leads to a concentration of isofetamid and metabolite GPTC residues in the processed product, whereas juicing, pureeing, processing to ketchup and canning lead to a reduction of residues in the processed products (Belgium, 2014). However, the submitted processing studies gave variable results for the same processes, not enabling the waiving of further studies, and therefore, in accordance with the data requirements, the number of studies was insufficient to derive robust-processing factors. Further processing studies would be required to propose processing factors for inclusion in Annex VI of Regulation (EC) No 396/2005 (European Commission, 1997d; OECD, 2008).

1.2.4. Proposed MRLs

The available data are considered sufficient to derive MRL proposals as well as risk assessment values for the commodities under evaluation (see Appendix B.1.2.1). In Section 3, EFSA assessed whether residues on these crops resulting from the intended uses are likely to pose a consumer health risk.

2. Residues in livestock

An assessment of potential residues in livestock is not required because the commodities under consideration are not used for feed purposes.

3. Consumer risk assessment

EFSA performed a dietary risk assessment using revision 2 of the EFSA PRIMo (EFSA, 2007). This exposure assessment model contains food consumption data for different subgroups of the EU population and allows the acute and chronic exposure assessment to be performed in accordance with the internationally agreed methodology for pesticide residues (FAO, 2016a).

The toxicological reference values for isofetamid used in the risk assessment (i.e. acceptable daily intake (ADI) and acute reference dose (ARfD) values) were derived in the framework of the EU pesticides peer review (EFSA, 2015). The toxicological reference values for isofetamid are considered to be applicable to the metabolite GPTC included in the risk assessment residue definition (EFSA, 2015).

The short-term exposure assessment was performed for the commodities assessed in this application in accordance with the internationally agreed methodology. The calculations were based on the HR derived from the supervised field trials and the complete list of input values can be found in Appendix D.2. The estimated short-term exposure did not exceed the ARfD for any of the crops assessed in this application (see Appendix B.3).

The long-term exposure assessment was performed, taking into account the STMR values derived for the commodities assessed in this application; for the remaining commodities covered by the MRL regulation, the existing EU MRLs and where relevant the STMR values derived by the Joint FAO/WHO Meeting on Pesticide Residues (JMPR) were selected as input values (FAO, 2016b). The complete list of input values is presented in Appendix D.2. The estimated long-term dietary intake was in the range from 2% to 20% of the ADI. The contribution of residues expected in the commodities assessed in this application to the overall long-term exposure is presented in more detail in Appendix B.3. EFSA concluded that the long-term intake of residues of isofetamid resulting from the existing and the intended uses is unlikely to present a risk to consumer health.

For further details on the exposure calculations, a screenshot of the report sheet of the PRIMo is presented in Appendix C.

4. Conclusion and Recommendations

The data submitted in support of this MRL application were found to be sufficient to derive MRL proposals for tomatoes, sweet peppers/bell peppers, aubergines/eggplants, okra/lady’s fingers and the whole subgroup of cucurbits with edible peel.
EFSA concluded that the proposed uses of isofetamid on tomatoes, peppers, aubergines, okra and cucurbits with edible peel will not result in a consumer exposure exceeding the toxicological reference values and therefore is unlikely to pose a risk to consumers' health.

The MRL recommendations are summarised in Appendix B.4.

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Abbreviations

a.s. active substance
ADI acceptable daily intake
ARFD acute reference dose
BBCH growth stages of mono- and dicotyledonous plants
bw body weight
CCPR Codex Committee on Pesticide Residues
CF conversion factor for enforcement to risk assessment residue definition
CXL Codex maximum residue limit
DALA days after last application
DAR draft assessment report
DAT days after treatment
DT$_{90}$ period required for 90% dissipation (define method of estimation)
EMS evaluating Member State
FAO Food and Agriculture Organization of the United Nations
GAP Good Agricultural Practice
HR highest residue
IEDI international estimated daily intake
IESTI international estimated short-term intake
ILV independent laboratory validation
ISO International Organisation for Standardisation
IUPAC International Union of Pure and Applied Chemistry
JMPR Joint FAO/WHO Meeting on Pesticide Residues
LC-MS/MS liquid chromatography with tandem mass spectrometry
LOD limit of detection
LOQ limit of quantification
LWA Leaf Wall Area
MRL maximum residue level
MS Member States
MS mass spectrometry detector
MS/MS tandem mass spectrometry detector
NEU northern Europe
OECD Organisation for Economic Co-operation and Development
PBI plant back interval
PF processing factor
PHI preharvest interval
PRIMo (EFSA) Pesticide Residues Intake Model
RA risk assessment
RAC raw agricultural commodity
RD residue definition
RMS rapporteur Member State
SANCO Directorate-General for Health and Consumers
SC suspension concentrate
SEU southern Europe
STMR supervised trials median residue
TRR total radioactive residue
WHO World Health Organization
Appendix A – Summary of intended GAP triggering the amendment of existing EU MRLs

| Crop and/or situation | NEU, SEU, MS or country | F G or I(a) | Pests or group of pests controlled | Preparation | Application | Method kind | Range of growth stages & season(c) | Number min-max | Interval between application (min) | g a.s./hL min-max | Water L/ha min-max | Rate | Unit | PHI (days)(d) | Remarks |
|----------------------|-------------------------|-------------|-----------------------------------|-------------|-------------|------------|-----------------------------------|----------------|-----------------------------------|----------------|----------------|------|------|-------------|---------|
| Cucurbits, edible peel | UK; BE; NL; DE; LU; CZ; PL; HU; RO; SK; SI | G | Botrytis cinerea anamorph of Botryotinia fuckeliana; Sclerotinia sp. | SC 400 g/L | Foliar spray | From BBCH 51 to BBCH 89 | 2 | 7 days | 40–64 | 750–1,200 | 480 | g a.s./ha | 1 | 360 g a.s./ha Leaf Wall Area (LWA) (to be evaluated by efficacy) |
| Tomato | UK; BE; NL; DE; LU; CZ; PL; HU; RO; SK; SI | G | Botrytis cinerea anamorph of Botryotinia fuckeliana; Sclerotinia sp. | SC 400 g/L | Foliar spray | From BBCH 51 to BBCH 89 | 2 | 7 days | 40–64 | 750–1,200 | 480 | g a.s./ha | 1 | 360 g a.s./ha Leaf Wall Area (LWA) (to be evaluated by efficacy) |
| Aubergine/eggplant | UK; BE; NL; DE; LU; CZ; PL; HU; RO; SK; SI | G | Botrytis cinerea anamorph of Botryotinia fuckeliana; Sclerotinia sp. | SC 400 g/L | Foliar spray | From BBCH 51 to BBCH 89 | 2 | 7 days | 40–64 | 750–1,200 | 480 | g a.s./ha | 1 | 360 g a.s./ha Leaf Wall Area (LWA) (to be evaluated by efficacy) |
| Peppers | UK; BE; NL; DE; LU; CZ; PL; HU; RO; SK; SI | G | Botrytis cinerea anamorph of Botryotinia fuckeliana; Sclerotinia sp. | SC 400 g/L | Foliar spray | From BBCH 51 to BBCH 89 | 2 | 7 days | 40–64 | 750–1,200 | 480 | g a.s./ha | 1 | 360 g a.s./ha Leaf Wall Area (LWA) (to be evaluated by efficacy) |
| Okra/lady’s fingers | UK; BE; NL; DE; LU; CZ; PL; HU; RO; SK; SI | G | Botrytis cinerea anamorph of Botryotinia fuckeliana; Sclerotinia sp. | SC 400 g/L | Foliar spray | From BBCH 51 to BBCH 89 | 2 | 7 days | 40–64 | 750–1,200 | 480 | g a.s./ha | 1 | 360 g a.s./ha Leaf Wall Area (LWA) (to be evaluated by efficacy) |

NEU: northern European Union; SEU: southern European Union; MS: Member State.
(a): Outdoor or field use (F), greenhouse application (G) or indoor application (I).
(b): CropLife International Technical Monograph no 2, 6th Edition. Revised May 2008. Catalogue of pesticide formulation types and international coding system.
(c): Growth stage range from first to 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.
(d): PHI: minimum preharvest interval.
Appendix B – List of end points

B.1. Residues in plants

B.1.1. Nature of residues and methods of analysis in plants

B.1.1.1. Metabolism studies, methods of analysis and residue definitions in plants

| Primary crops (available studies) | Crop groups | Crop(s) | Application(s) | Sampling (DAT) | Comment/Source |
|-----------------------------------|-------------|---------|----------------|----------------|----------------|
| Fruit crops                       | Grape       | 3 × 750 g/ha foliar spray, 13-14 day intervals, BBCH 67–69, 71–75 and 77–79 | 43 DALA | Radiolabelled active substance: [14C-phenyl]-isofetamid or [14C-(C2)-thiophene]-isofetamid Belgium (2014) |
| Leafy crops                       | Lettuce     | 3 × 750 g/ha foliar spray, 14 day intervals | 18 DALA | Radiolabelled active substance: [14C-phenyl]-isofetamid or [14C-(C2)-thiophene]-isofetamid Belgium (2014) |
| Pulses/oilseeds                   | French bean | 3 × 750 g/ha foliar spray, 8 day intervals, first application at BBCH 60–61 | 0, 14, 68 DALA | Radiolabelled active substance: [14C-phenyl]-isofetamid or [14C-(C2)-thiophene]-isofetamid Belgium (2014) |

| Rotational crops (available studies) | Crop groups | Crop(s) | Application(s) | PBI (DAT) | Comment/Source |
|--------------------------------------|-------------|---------|----------------|-----------|----------------|
| Root/tuber crops                     | Carrot      | 1 × 2,134 to 2,152 g/ha, bare soil application | 30, 120 and 365 | Radiolabelled active substance: [14C-phenyl]-isofetamid Belgium (2014) |
| Leafy crops                          | Lettuce     | 1 × 2,134 to 2,152 g/ha, bare soil application | 30, 120 and 365 | Radiolabelled active substance: [14C-phenyl]-isofetamid Belgium (2014) |
| Cereal (small grain)                 | Wheat       | 1 × 2,134 to 2,152 g/ha, bare soil application | 30, 120 and 365 | Radiolabelled active substance: [14C-phenyl]-isofetamid Belgium (2014) |
### Processed Commodities (Hydrolysis Study)

| Conditions                               | Stable? | Comment/Source |
|------------------------------------------|---------|----------------|
| Pasteurisation (20 min, 90°C, pH 4)      | Yes     | EFSA (2015)    |
| Baking, brewing and boiling (60 min, 100°C, pH 5) | Yes     | EFSA (2015)    |
| Sterilisation (20 min, 120°C, pH 6)      | Yes     | EFSA (2015)    |

#### Residue Pattern

- **Can a general residue definition be proposed for primary crops?**
  - Yes
  - EFSA (2015)

- **Rotational crop and primary crop metabolism similar?**
  - Yes
  - Rotational crop metabolism similar but more extensive with further conjugation than in primary crop

- **Residue pattern in processed commodities similar to residue pattern in raw commodities?**
  - Yes
  - Isofetamid stable under standard hydrolysis conditions

- **Plant residue definition for monitoring (RD-Mo)**
  - Isofetamid

- **Plant residue definition for risk assessment (RD-RA)**
  - Sum of isoetamid and metabolite GPTC, expressed as isoetamid

- **Methods of analysis for monitoring of residues (analytical technique, crop groups, LOQs)**
  - Food/feed of plant origin: Matrices with high water content, high acid content and dry matrices: LC–MS/MS, LOQ = 0.01 mg/kg, ILV available (Belgium, 2014; EFSA, 2015)
  - Food/feed of animal origin: No data provided; no data required (EFSA, 2015)

**LOQ:** Limit of quantification; **LC–MS/MS:** Liquid chromatography with tandem mass spectrometry; **ILV:** independent laboratory validation.
## B.1.1.2. Stability of residues in plants

| Plant products (available studies) | Category              | Commodity      | T (°C) | Stability period | Compounds covered   | Comment/Source |
|-----------------------------------|------------------------|----------------|--------|-----------------|---------------------|----------------|
|                                   | High water content     | Lettuces       | –20    | 12 Months       | Isofetamid, GPTC    | EFSA (2015)    |
|                                   | High water content     | Potatoes       | –20    | 12 Months       | Isofetamid, GPTC    | EFSA (2015)    |
|                                   | High oil content       | Almonds        | –20    | 12 Months       | Isofetamid, GPTC    | EFSA (2015)    |
|                                   | High oil content       | Oilseed rape   | –20    | 12 Months       | Isofetamid, GPTC    | EFSA (2015)    |
|                                   | High protein content   | Beans          | –20    | 12 Months       | Isofetamid, GPTC    | EFSA (2015)    |
|                                   | High starch            |                | –      |                 |                     |                |
|                                   | High acid content      | Grapes         | –20    | 12 Months       | Isofetamid, GPTC    | EFSA (2015)    |
|                                   | Processed products     |                | –      |                 |                     |                |
|                                   | Others                 |                | –      |                 |                     |                |
### B.1.2. Magnitude of residues in plants

#### B.1.2.1. Summary of residues data from the supervised residue trials

| Commodity | Region/Indoor<sup>(a)</sup> | Residue levels observed in the supervised residue trials (mg/kg) | Comments/Source | Calculated MRL<sup>(c)</sup> (mg/kg) | HR<sup>(b)</sup> (mg/kg) | STMR<sup>(c)</sup> (mg/kg) | CF<sup>(d)</sup> |
|-----------|-----------------------------|---------------------------------------------------------------|----------------|-------------------------------|----------------|-----------------------------|-------------|
| Tomatoes, Aubergines/eggplants | Indoor | Mo: 0.17, 0.22, 0.44, 0.45, 0.49, 0.52, 0.58, 0.93<br>RA: 0.18, 0.23, 0.45, 0.46, 0.50, 0.53, 0.59, 0.94 | Residue trials on tomatoes compliant with GAP. Extrapolation to aubergines/eggplants possible. Levels of metabolite GPTC were below the LOQ, and therefore, the LOQ value of 0.01 mg/kg was used multiplied by the molecular mass conversion factor of 0.75<br>1 Mo: 0.93<br>RA: 0.94 | 1.5 | Mo: 0.47<br>RA: 0.48 | 1.02 |
| Sweet peppers/bell peppers, Okra/lady’s fingers | Indoor | Mo: 0.14, 0.20, 0.25, 0.44, 0.69, 0.71, 0.74, 1.65<br>RA: 0.15, 0.21, 0.26, 0.45, 0.70, 0.72, 0.75, 1.66 | Residue trials on peppers compliant with GAP. Extrapolation to okra/lady’s fingers possible. Levels of metabolite GPTC were below the LOQ, and therefore, the LOQ value of 0.01 mg/kg was used multiplied by the molecular mass conversion factor of 0.75<br>3 Mo: 1.65<br>RA: 1.66 | 3 | Mo: 0.57<br>RA: 0.57 | 1.01 |
| Cucurbits with edible peel | Indoor | Mo: 0.04, 0.05, 0.10, 2 × 0.12, 0.13, 0.44, 0.55<br>RA: 0.05, 0.06, 0.11, 2 × 0.13, 0.14, 0.45, 0.56 | Residue trials on cucumbers compliant with GAP. Extrapolation to cucurbits with edible peel possible. Levels of metabolite GPTC were below the LOQ, and therefore, the LOQ value of 0.01 mg/kg was used multiplied by the molecular mass conversion factor of 0.75<br>1 Mo: 0.55<br>RA: 0.56 | 1 | Mo: 0.12<br>RA: 0.13 | 1.06 |

<sup>(a)</sup>: NEU: Outdoor trials conducted in northern Europe, SEU: Outdoor trials conducted in southern Europe; Indoor: indoor EU trials or Country code: if non-EU trials.

<sup>(b)</sup>: Highest residue. The highest residue for risk assessment refers to the whole commodity and not to the edible portion.

<sup>(c)</sup>: Supervised trials median residue. RA: The median residue for risk assessment refers to the whole commodity and not to the edible portion. Mo: Supervised trials median residue according to the residue definition for monitoring. Minor difference in the STMR-RA value for peppers in the evaluation report is due to rounding of residue values (Belgium, 2017).

<sup>(d)</sup>: Conversion factor to recalculate residues according to the residue definition for monitoring to the residue definition for risk assessment.
B.1.2.2. Residues in rotational crops

Residues in rotational and succeeding crops expected based on confined rotational crop study?

| Yes | Following soil application of isofetamid at ca 2150 g/ha, parent isofetamid in succeeding crops was detected in lower amounts and proportions than in primary crops and the residues mainly composed of the GPTC and GPTC-malonyl metabolites accounting together up to ca 40% TRR in carrot roots (0.02 mg/kg) and up to ca 60% TRR in lettuce (0.06 mg/kg) at the 120 day plant back interval. (EFSA, 2015) |

Residues in rotational and succeeding crops expected based on field rotational crop study?

| No | Field rotational crop studies demonstrated that no significant residues (residues of isofetamid and GPTC below 0.01 mg/kg and residues of GPTC-malonyl at or below 0.02 mg/kg) are expected in the edible parts of succeeding crops (spinach, radish and winter barley) planted in soil following foliar applications to primary crop (lettuce) treated at 2 × 400 g a.s./ha (Belgium, 2014; EFSA, 2015). The field rotational crop study was under dosed (0.83N) in relation to the total seasonal application rates for the proposed uses (960 g a.s./ha); however, considering the levels of residues observed in the field rotational crop study were not only below the LOQ (0.01 mg/kg) but also most instances below the LOD (0.004 mg/kg), it was concluded that significant residues are not expected to occur in succeeding crops, provided that the active substance is applied according to the proposed GAPs |

LOD: limit of detection; LOQ: limit of quantification; GAP: good agricultural practice; TRR: total radioactive residue.

B.1.2.3. Processing factors

| Processed commodity | Number of valid studies(a) | Processing Factor (PF) | CFp(b) | Comment/Source |
|---------------------|---------------------------|------------------------|--------|----------------|
| Tomato, juice       | 2                         | 0.17, 0.07             | –      | Insufficient number of studies to derive robust-processing factors (Belgium, 2017) |
| Tomato, puree       | 2                         | 0.11, 0.06             | –      | Insufficient number of studies to derive robust-processing factors (Belgium, 2017) |
| Tomato, ketchup     | 2                         | 0.23, 0.12             | –      | Insufficient number of studies to derive robust-processing factors (Belgium, 2017) |
| Tomato, canned fruit| 2                         | 0.11, 0.03             | –      | Insufficient number of studies to derive robust-processing factors (Belgium, 2017) |
| Tomato, dried       | 2                         | 8.3, 2.0               | –      | Insufficient number of studies to derive robust-processing factors (Belgium, 2017) |

(a): Studies with residues in the RAC at or close to the LOQ were disregarded (unless concentration may occur).
(b): Conversion factor for risk assessment in the processed commodity; median of the individual conversion factors for each processing residues trial.
B.2. **Residues in livestock**

Not relevant as the commodities under consideration are not used for feed purposes.

B.3. **Consumer risk assessment**

| ARfD | 1 mg/kg bw (EFSA, 2015) |
|------|------------------------|
| Highest IESTI, according to EFSA PRIMo | Peppers: 10.5% of ARfD; Tomatoes: 5.5% of ARfD; Cucumbers: 3.3% of ARfD; Courgettes: 2.6% of ARfD; Aubergines (egg plants): 2.4% of ARfD |
| Assumptions made for the calculations | The calculation is based on the highest residue levels expected in raw agricultural commodities assessed in this application |

**ARfD**: acute reference dose.

| ADI | 0.02 mg/kg bw per day (EFSA, 2015) |
|-----|-------------------------------|
| Highest IEDI, according to EFSA PRIMo | 19.9% ADI (WHO Cluster diet B); Contribution of crops assessed: Tomatoes: 7.4% of ADI; Wine grapes: 6.4% of ADI; Peppers: 1.4% of ADI |
| Assumptions made for the calculations | The calculation is based on the median residue levels derived for the raw agricultural commodities assessed in this application; for the remaining commodities covered by the MRL regulation, the median residue values derived in previous assessments or existing EU MRLs were selected. The JMPR derived median residue levels, according to the JMPR residue definition for risk assessment, were multiplied by the EFSA derived conversion factor for risk assessment. A conversion factor (CF) for enforcement to risk assessment was not necessary because MRLs for all the remaining commodities plant and animal commodities are set at the LOQ |

**ADI**: acceptable daily intake; EU MRL: European Union maximum residue level; JMPR: Joint FAO/WHO Meeting on Pesticide Residues.
### B.4. Recommended MRLs

| Code(a) | Commodity                | Existing EU MRL (mg/kg) | Proposed EU MRL (mg/kg) | Comment/justification                                                                 |
|---------|--------------------------|-------------------------|-------------------------|---------------------------------------------------------------------------------------|
| 0231010 | Tomatoes                 | 0.01*                   | 1.5                     | The submitted data are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0231020 | Sweet peppers/bell peppers | 0.01*                   | 3                       | The submitted data are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0231030 | Aubergines/eggplants     | 0.01*                   | 1.5                     | The submitted data on tomatoes are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0231040 | Okra/lady's fingers      | 0.01*                   | 3                       | The submitted data on peppers are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |
| 0232000 | Cucurbits with edible peel | 0.01*                   | 1                       | The submitted data on cucumbers are sufficient to derive a MRL proposal for indoor/greenhouse use. Risk for consumers unlikely |

**Enforcement residue definition:** isofetamid

EU MRL: European Union maximum residue level.

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

(a): Commodity code number according to Annex I of Regulation (EC) No 396/2005.
## Appendix C – Pesticide Residue Intake Model (PRIMo)

### Isofetamid

| Status of the active substance: | Approved |
|--------------------------------|----------|
| Code no. | LOQ (mg/kg bw): | Proposed LOQ |
|---------|-----------------|--------------|
|          | 0.01            |              |

| Toxicological end points | ADI (mg/kg bw per day): | NOAEL (mg/kg bw): | 1 |
|-------------------------|-------------------------|------------------|---|
|                        | 0.02                    | Source of ADI: EFSA | Year of evaluation: 2015 |
|                        |                        | Source of ARfD: EFSA | Year of evaluation: 2015 |

| Year of evaluation: | 2015 |
|---------------------|------|

| Source of ADI: EFSA | Year of evaluation: 2015 |
|---------------------|--------------------------|

| Source of ARfD: EFSA | Year of evaluation: 2015 |
|----------------------|--------------------------|

| No of diets exceeding ADI: | --- |
|-----------------------------|-----|

### Chronic risk assessment – refined calculations

| Commodity/group of commodities | TMDI (mg/kg bw per day) in % of ADI |
|--------------------------------|-----------------------------------|
| Tomato                        | 19.9                               |
| Wine grapes                   | 16.9                               |
| Fruits                        | 10.0                               |
| Milk and cream                | 8.5                                |
| All population                | 7.9                                |
| Child                         | 7.6                                |
| Adult                         | 6.5                                |
| General population            | 6.2                                |
| Toddler                       | 6.1                                |
| Adult                         | 6.1                                |
| Vegetarian                    | 5.8                                |
| General population            | 5.8                                |
| Toddler                       | 5.5                                |
| Adult                         | 5.3                                |
| Child                         | 5.0                                |
| Infant                        | 4.9                                |
| General population            | 4.6                                |
| Infant                        | 4.6                                |
| General population            | 4.1                                |
| Infant                        | 3.4                                |
| General population            | 2.8                                |
| Infant                        | 1.5                                |

### Conclusion:

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

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Modifications to the calculations include:

- The TMDI values are adjusted based on pTMRLs.
- Chronic risk assessment calculations are refined and include
  - TMDI values in % of ADI
  - Minimum – maximum

The risk assessment has been performed on the basis of the MRLs collected from Member States in April 2006. For each pesticide/commodity the highest national MRL was identified (proposed temporary MRL = pTMRL).

The pTMRLs have been submitted to EFSA in September 2006.

The EFSA report on pTMRLs from Reg. (EU) 2017/171. EFSA-Q-2018-00070 MRLs from Reg. (EU) 2017/171.

www.efsa.europa.eu/efsajournal.
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 variability factor of 3.

Threshold MRLs are the calculated residue levels which would result in an exposure equivalent to 100% of the ARfD.

No exceedance of the ARfD/ADI was identified for any unprocessed commodity.

Conclusion:
For Isofetamid, 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.

### Table: Commodities with exceedance of ARfD/ADI

| Commodity      | IESTI 1 | IESTI 2 |
|----------------|---------|---------|
| Peppers        | 10.5    | 2.7     |
| Tomatoes       | 5.5     | 2.3     |
| Cucumbers      | 3.3     | 1.5     |
| Courgettes     | 2.6     | 1.4     |
| Aubergines     | 2.4     | 1.1     |
| Grape juice    | 13.2    | 1.3     |
| Wine           | 0.2     | 0.0     |
| Grapes (raisins)| 0.1    | 0.0     |
| Orange juice   | 0.0     | 0.0     |

### Table: Processed commodities

| Processed commodity | IESTI 1 | IESTI 2 |
|---------------------|---------|---------|
| Grape juice         | 13.2    | 1.3     |
| Wine                | 0.2     | 0.0     |
| Grapes (raisins)    | 0.1     | 0.0     |
| Apple juice         | 0.0     | 0.0     |

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

***) pTMRL: provisional temporary MRL for unprocessed commodity.
## Appendix D – Input values for the exposure calculations

### D.1. Livestock dietary burden calculations

| Feed commodity          | Median dietary burden | Maximum dietary burden |
|-------------------------|-----------------------|------------------------|
|                         | Input value (mg/kg)   | Comment                | Input value (mg/kg)   | Comment                |
| Commodities under assessment are not fed to livestock.

### D.2. Consumer risk assessment

| Commodity                | Chronic risk assessment | Acute risk assessment |
|--------------------------|-------------------------|-----------------------|
|                         | Input value (mg/kg)     | Comment               | Input value (mg/kg)   | Comment               |
| **Plant residue definition for risk assessment:** Sum of isofetamid and metabolite GPTC, expressed as isofetamid |
| 0231010 Tomatoes         | 0.48 STMR               | 0.94 HR               |
| 0231020 Sweet peppers/bell peppers | 0.57 STMR          | 1.66 HR               |
| 0231030 Aubergines/eggplants | 0.48 STMR tomatoes   | 0.94 HR tomatoes      |
| 0231040 Okra/lady’s fingers | 0.57 STMR peppers      | 1.66 HR peppers       |
| 0232010 Cucumbers        | 0.13 STMR               | 0.56 HR               |
| 0232020 Gherkins         | 0.13 STMR cucumbers     | 0.56 HR cucumbers     |
| 0232030 Courgettes       | 0.13 STMR cucumbers     | 0.56 HR cucumbers     |
| 0232990 Other cucurbits with edible peel | 0.13 STMR cucumbers     | 0.56 HR cucumbers     |
| 0140010 Apricots         | 0.017 STMR, 'no-residue situation’ EFSA (2015) |                      |
| 0140020 Cherries         | 0.017 STMR, 'no-residue situation’ EFSA (2015) |                      |
| 0151010 Table grapes     | 0.710 STMR EFSA (2015)  |                      |
| 0151020 Wine grapes      | 0.710 STMR EFSA (2015)  |                      |
| 0152000 Strawberries     | 0.500 STMR(JMPR) × CF (0.49 × 1.02) FAO (2016b); EFSA (2015)\(^{(a)}\) |                      |
| 0154020 Cranberries      | 0.500 STMR(JMPR) × CF (0.49 × 1.02) FAO (2016b); EFSA (2015)\(^{(b)}\) |                      |
| 0251020 Lettuces         | 0.047 EFSA (2015)       |                      |
| 0252000 Spinaches and similar leaves | 0.047 EFSA (2015)     |                      |
| 0256000 Herbs and edible flowers | 0.047 EFSA (2015)     |                      |

Acute risk assessment was undertaken only with regard to the crops under consideration.
### Commodity

| Commodity                  | Chronic risk assessment | Acute risk assessment |
|----------------------------|-------------------------|-----------------------|
| Input value (mg/kg)        | Comment                 | Input value (mg/kg)   | Comment                 |
| 0401010 Linseeds           | 0.017 STMR rapeseeds EFSA (2015) |                      |                        |
| 0401030 Poppy seeds        | 0.017 STMR rapeseeds EFSA (2015) |                      |                        |
| 0401060 Rapeseeds/canola seeds | 0.017 STMR, ‘no-residue situation’ EFSA (2015)(c) |                      |                        |
| 0401080 Mustard seeds      | 0.017 STMR rapeseeds EFSA (2015) |                      |                        |
| 0401130 Gold of pleasure seeds | 0.017 STMR rapeseeds EFSA (2015) |                      |                        |
| Other plant commodities    | MRL                     | MRLs in Commission Regulation (EU) 2017/171. A conversion factor (CF) for enforcement to risk assessment was not necessary because MRLs for all other plant commodities are set at the LOQ |                      |

**Animal residue definition for risk assessment:** Sum isofetamid and metabolite PPA, expressed as isofetamid (provisional)

| Animal commodities | MRL | MRLs in Commission Regulation (EU) 2017/171. A conversion factor (CF) for enforcement to risk assessment was not necessary because MRLs for all animal commodities are set at the LOQ | Acute risk assessment was undertaken only with regard to the crops under consideration |
|--------------------|-----|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|

(a): JMPR STMR value based on more critical Canada and USA GAPs. JMPR residue definition for risk assessment for plant commodities: Isofetamid. EFSA derived a CF of 1.02 and an STMR value of 0.362 mg/kg on the basis of a less critical EU GAP and indoor residue trials. Outdoor EU trials resulted in lower residues.

(b): JMPR STMR value based on Canada and USA GAPs. JMPR residue definition for risk assessment for plant commodities: Isofetamid. EFSA derived a CF of 1.02 for strawberries on the basis of an EU GAP.

(c): It is noted that the JMPR derived an STMR value of 0.01 mg/kg on the basis of more critical Canada and USA GAPs (FAO, 2016b). JMPR residue definition for risk assessment for plant commodities: Isofetamid.

(d): Commission Regulation (EU) 2017/171 of 30 January 2017 amending Annexes II, III and IV to Regulation (EC) No 396/2005 of the European Parliament and of the Council as regards maximum residue levels for aminopyralid, azoxystrobin, cyantraniliprole, cyflufenamid, cyproconazole, diethofencarb, dithiocarbamates, fluazifop-P, fluopyram, haloxyfop, isofetamid, metalaxyl, prohexadione, propaquizafop, pyrimethanil, Trichoderma atroviride strain SC1 and zoxamide in or on certain products. C/2017/0401. OJ L 30, 3.2.2017, p. 45–111.
## Appendix E – Used compound codes

| Code/trivial name | IUPAC name/SMILES notation/InChIKey<sup>(a)</sup> | Structural formula<sup>(b)</sup> |
|------------------|-------------------------------------------------|----------------------------------|
| Isofetamid IKF-5411 | \(N\{1,1\text{-dimethyl}-2\text{-}(4\text{-isopropoxy-o-tolyl})-2\text{-oxoethyl}\}\text{-}3\text{-methylthiophene-2-carboxamide} \) | ![Structural formula for Isofetamid IKF-5411](image) |
| PPA | \((2R\text{-})\text{-}2\text{-}[3\text{-methyl-4\text{-}[2\text{-methyl-N}(3\text{-methylthiophene-2-carbonyl})alanyl\]phenoxy\] propanoic acid \) | ![Structural formula for PPA](image) |
| GPTC | \(N\{1\text{-}[4\text{-}(D\text{-}glucopyranosyloxy)-2\text{-methylphenyl}\}2\text{-methyl-1\text{-oxopropan-2-yl}]-3\text{-methylthiophene-2-carboxamide} \) | ![Structural formula for GPTC](image) |
| GPTC-malonyl | \(3\text{-methyl-4\text{-}[2\text{-methyl-N}(3\text{-methylthiophene-2-carbonyl})alanyl\]phenyl\}6\text{-O\text{-}(carboxyacetyl)\}D\text{-glucopyranoside} \) | ![Structural formula for GPTC-malonyl](image) |
| IBA | \(2\text{-methyl-4\text{-}(propan-2-yloxy)benzoic acid} \) | ![Structural formula for IBA](image) |
| 3-MTCAM | \(3\text{-methylthiophene-2-carboxamide} \) | ![Structural formula for 3-MTCAM](image) |
| 3-MTCA | \(3\text{-methylthiophene-2-carboxylic acid} \) | ![Structural formula for 3-MTCA](image) |

<sup>(a)</sup>: ACD/Name 2015 ACD/Labs 2015 Release (File version N20E41, Build 75170, 19 December 2014).

<sup>(b)</sup>: ACD/ChemSketch 2015 ACD/Labs 2015 Release (File version C10H41, Build 75059, 17 December 2014).