



2024/239

16.1.2024

**COMMISSION IMPLEMENTING REGULATION (EU) 2024/239**

**of 15 January 2024**

**correcting and amending Implementing Regulations (EU) 2022/1421, (EU) 2022/652, (EU) 2022/1490  
and (EU) 2022/320**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 1831/2003 of the European Parliament and of the Council of 22 September 2003 on additives for use in animal nutrition <sup>(1)</sup>, and in particular Article 9(2) thereof,

Whereas:

- (1) The use of expressed orange essential oil, distilled orange essential oil and folded orange oils from *Citrus sinensis* (L.) Osbeck as feed additives was authorised for all animal species by Commission Implementing Regulation (EU) 2022/1421 <sup>(2)</sup> for a 10-year period. In Article 2 of Implementing Regulation (EU) 2022/1421, transitional measures concerning feed materials and compound feed containing the additives concerned and which are intended for non-food producing animals were erroneously omitted. Furthermore, in its opinion of 29 September 2021 <sup>(3)</sup>, the European Food Safety Authority ('the Authority') could not conclude on the safety of expressed orange essential oil, distilled orange essential oil and folded orange oils from *Citrus sinensis* (L.) Osbeck as feed additives for dogs, cats, ornamental fish and ornamental birds, because they are not normally exposed to citrus by-products. The Authority also clarified that folded orange oil identified as 2b143-f-ii in the Annex to Implementing Regulation (EU) 2022/1421 is not intended for use in horses, rabbits, dogs, cats, ornamental fish and ornamental birds. Those species should therefore not have been included in the column 'species or category of animal' of the Annex to Implementing Regulation (EU) 2022/1421 in relation to the additives concerned. The title of Implementing Regulation (EU) 2022/1421 should be adjusted accordingly to reflect the fact that the authorisation of the additives concerned relates to certain animal species only.
- (2) The use of bitter orange extract as a feed additive was authorised for certain animal species by Commission Implementing Regulation (EU) 2022/652 <sup>(4)</sup> for a 10-year period. In its opinion of 23 June 2021 <sup>(5)</sup>, the Authority could not conclude on the safety of bitter orange extract as a feed additive for dogs, cats and ornamental fish, because they are not normally exposed to citrus by-products. In addition, an entry covering other animal species than those mentioned in the Annex to Implementing Regulation (EU) 2022/652 was erroneously omitted. Therefore, the column 'species or category of animal' of the Annex to Implementing Regulation (EU) 2022/652 should refer to all animal species except dogs, cats, ornamental fish as well as ornamental birds, which are also not normally exposed to citrus by-products according to the conclusions of the Authority in its opinion of 29 September 2021.

<sup>(1)</sup> OJ L 268, 18.10.2003, p. 29.

<sup>(2)</sup> Commission Implementing Regulation (EU) 2022/1421 of 22 August 2022 concerning the authorisation of expressed orange essential oil, distilled orange essential oil and folded orange oils from *Citrus sinensis* (L.) Osbeck as feed additives for all animal species (OJ L 218, 23.8.2022, p. 27).

<sup>(3)</sup> Safety and efficacy of feed additives consisting of expressed sweet orange peel oil and its fractions from *Citrus sinensis* (L.) Osbeck for use in all animal species (FEFANA asbl) (*EFSA Journal* 2021;19(11):6891. doi: org/10.2903/j.efsa.2021.6891).

<sup>(4)</sup> Commission Implementing Regulation (EU) 2022/652 of 20 April 2022 concerning the authorisation of bitter orange extract as a feed additive for certain animal species (OJ L 119, 21.4.2022, p. 74).

<sup>(5)</sup> Safety and efficacy of a feed additive consisting of a flavonoid-rich dried extract of *Citrus x aurantium* L. fruit (bitter orange extract) for use in all animal species (FEFANA asbl) (*EFSA Journal* 2021;19(7):6709. doi: 10.2903/j.efsa.2021.6709).

- (3) The use of expressed lemon essential oil, residual fraction of expressed lemon oil distilled, distilled lemon essential oil (volatile fraction) and distilled lime essential oil as feed additives was authorised for certain animal species by Commission Implementing Regulation (EU) 2022/1490 <sup>(6)</sup> for a 10-year period. In its opinion of 18 March 2021 <sup>(7)</sup>, the Authority could not conclude on the safety of expressed lemon oil and its residual fraction and of lime oil as feed additives for companion animals and ornamental fish, because they are not normally exposed to citrus by-products. Ornamental fish should therefore not have been included in the column 'species or category of animal' of the Annex to Implementing Regulation (EU) 2022/1490 for the additive identified as 2b141-eo. In addition, an entry covering other animal species except dogs, cats, ornamental fish, as well as ornamental birds, which are also not normally exposed to citrus by-products according to the conclusions of the Authority in its opinion of 29 September 2021, was erroneously omitted and should therefore be included in the column 'species or category of animal' of the Annex to Implementing Regulation (EU) 2022/1490 for the additives identified as 2b139-eo, 2b139-rf and 2b141-eo. Finally, an entry covering 'other animal species' was erroneously omitted and should therefore be included in the column 'species or category of animal' of the Annex to Implementing Regulation (EU) 2022/1490 for the additive identified as 2b139-di.
- (4) The use of expressed mandarin essential oil as a feed additive was authorised for poultry, pigs, ruminants, horses, rabbits and salmonids by Commission Implementing Regulation (EU) 2022/320 <sup>(8)</sup> for a 10-year period. In Article 2 of Implementing Regulation (EU) 2022/320, transitional measures concerning feed materials and compound feed containing the additive concerned and which are intended for non-food producing animals were erroneously omitted. Furthermore, an entry covering 'other animal species' was erroneously omitted in the column 'species or category of animal' of the Annex to Implementing Regulation (EU) 2022/320. In its opinion of 5 May 2021 <sup>(9)</sup>, the Authority could not conclude on the safety of expressed mandarin essential oil as a feed additive for dogs, cats and ornamental fish, because they are not normally exposed to citrus by-products. In its opinion of 29 September 2021, the Authority concluded that ornamental birds are also not normally exposed to citrus by-products. Therefore, an entry covering other animal species except dogs, cats, ornamental fish and ornamental birds should be included in the column 'species or category of animal' of the Annex to Implementing Regulation (EU) 2022/320. The title of Implementing Regulation (EU) 2022/320 should be adjusted accordingly to reflect the fact that the authorisation of expressed mandarin essential oil relates to a broader list of animal species.
- (5) Implementing Regulations (EU) 2022/1421, (EU) 2022/652, (EU) 2022/1490 and (EU) 2022/320 should therefore be corrected accordingly.
- (6) Since safety reasons do not require the immediate application of the corrections, it is appropriate to provide for an extension of the transitional periods laid down in Implementing Regulations (EU) 2022/1421, (EU) 2022/652, (EU) 2022/1490 and (EU) 2022/320 for the interested parties to prepare themselves to meet the requirements resulting from those corrections. Those Implementing Regulations should therefore be amended accordingly.
- (7) The measures provided for in this Regulation are in accordance with the opinion of the Standing Committee on Plants, Animals, Food and Feed,

<sup>(6)</sup> Commission Implementing Regulation (EU) 2022/1490 of 1 March 2022 concerning the authorisation of expressed lemon essential oil, residual fraction of expressed lemon oil distilled, distilled lemon essential oil (volatile fraction) and distilled lime essential oil as feed additives for certain animal species (OJ L 234, 9.9.2022, p. 1).

<sup>(7)</sup> Safety and efficacy of feed additives consisting of expressed lemon oil and its fractions from *Citrus limon* (L.) Osbeck and of lime oil from *Citrus aurantiifolia* (Christm.) Swingle for use in all animal species (FEFANA asbl) (*EFSA Journal* 2021;19(4):6548. doi: org/10.2903/j.efsa.2021.6548).

<sup>(8)</sup> Commission Implementing Regulation (EU) 2022/320 of 25 February 2022 concerning the authorisation of expressed mandarin essential oil as a feed additive for poultry, pigs, ruminants, horses, rabbits and salmonids (OJ L 55, 28.2.2022, p. 41).

<sup>(9)</sup> Safety and efficacy of a feed additive consisting of expressed mandarin oil from the fruit peels of *Citrus reticulata* Blanco for use in all animal species (FEFANA asbl) (*EFSA Journal* 2021;19(6):6625. doi: 10.2903/j.efsa.2021.6625).

HAS ADOPTED THIS REGULATION:

*Article 1*

**Correction and amendment to Implementing Regulation (EU) 2022/1421**

1. The title of Implementing Regulation (EU) 2022/1421 is replaced by the following:

‘Commission Implementing Regulation (EU) 2022/1421 of 22 August 2022 concerning the authorisation of expressed orange essential oil, distilled orange essential oil and folded orange oils from *Citrus sinensis* (L.) Osbeck as feed additives for certain animal species’.

2. Article 2 of Implementing Regulation (EU) 2022/1421 is replaced by the following:

*Article 2*

**Transitional measures**

1. The substances specified in the Annex and premixtures containing these substances, which are produced and labelled before 5 August 2024 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted.
2. Compound feed and feed materials containing the substances specified in the Annex, which are produced and labelled before 5 February 2025 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for food-producing animals.
3. Compound feed and feed materials containing the substances specified in the Annex, which are produced and labelled before 5 February 2026 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for non-food-producing animals.’
3. The Annex to Implementing Regulation (EU) 2022/1421 is replaced by Annex I to this Regulation.

*Article 2*

**Correction and amendment to Implementing Regulation (EU) 2022/652**

1. Article 2 of Implementing Regulation (EU) 2022/652 is replaced by the following:

*Article 2*

**Transitional measures**

1. The substance specified in the Annex and premixtures containing this substance, which are produced and labelled before 5 August 2024 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted.
2. Compound feed and feed materials containing the substance specified in the Annex, which are produced and labelled before 5 February 2025 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for food-producing animals.
3. Compound feed and feed materials containing the substance specified in the Annex, which are produced and labelled before 5 February 2026 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for non-food-producing animals.’
2. The Annex to Implementing Regulation (EU) 2022/652 is replaced by Annex II to this Regulation.

*Article 3***Correction and amendment to Implementing Regulation (EU) 2022/1490**

1. Article 2 of Implementing Regulation (EU) 2022/1490 is replaced by the following:

*'Article 2*

**Transitional measures**

1. The substances specified in the Annex and premixtures containing these substances, which are produced and labelled before 5 August 2024 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted.
  2. Compound feed and feed materials containing the substances specified in the Annex, which are produced and labelled before 5 February 2025 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for food-producing animals.
  3. Compound feed and feed materials containing the substances specified in the Annex, which are produced and labelled before 5 February 2026 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for non-food-producing animals.'
2. The Annex to Implementing Regulation (EU) 2022/1490 is replaced by Annex III to this Regulation.

*Article 4***Correction and amendment to Implementing Regulation (EU) 2022/320**

1. The title of Implementing Regulation (EU) 2022/320 is replaced by the following:

*'Commission Implementing Regulation (EU) 2022/320 of 25 February 2022 concerning the authorisation of expressed mandarin essential oil as a feed additive for certain animal species.'*

2. Article 2 of Implementing Regulation (EU) 2022/320 is replaced by the following:

*'Article 2*

**Transitional measures**

1. The substance specified in the Annex and premixtures containing this substance, which are produced and labelled before 5 August 2024 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted.
  2. Compound feed and feed materials containing the substance specified in the Annex, which are produced and labelled before 5 February 2025 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for food-producing animals.
  3. Compound feed and feed materials containing the substance specified in the Annex, which are produced and labelled before 5 February 2026 in accordance with the rules applicable before 5 February 2024, may continue to be placed on the market and used until the existing stocks are exhausted if they are intended for non-food-producing animals.'
3. The Annex to Implementing Regulation (EU) 2022/320 is replaced by Annex IV to this Regulation.

*Article 5***Entry into force**

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 15 January 2024.

*For the Commission*  
*The President*  
Ursula VON DER LEYEN

Identification number of the additive	Additive	Composition, chemical formula, description, analytical method.	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
					mg active substance/kg of complete feed with a moisture content of 12 %			

**Category: Sensory additives. Functional group: Flavouring compounds**

2b143-eo	Expressed orange essential oil	<p><i>Additive composition</i></p> <p>Expressed orange essential oil from fruit peels of <i>Citrus sinensis</i> (L.) Osbeck (1).</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Essential oil derived by cold expression from fruit peel of <i>Citrus sinensis</i> (L.) Osbeck as defined by the Council of Europe (2).</p> <p>In the volatile fraction:</p> <p>d-Limonene: 93-97 %</p> <p>Myrcene: 1,5-3,5 %</p> <p>Sabinene: 0,1-1,0 %</p> <p>α-Pinene: 0,4-0,8 %</p> <p>Linalool: 0,1-0,7 %</p> <p>Decanal: 0,1-0,7 %</p> <p>Octanal: 0,1-0,6 %</p> <p>Perillaldehyde: &lt; 0,05 %</p> <p>CAS number: 8028-48-6</p> <p>Einecs number: 232-433-8</p> <p>FEMA number: 2825</p> <p>CoE number: 143</p>	Chickens for fattening and minor poultry species for fattening	—	—	80	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>Mixture with other botanical additives is permitted provided that the amounts of perillaldehyde added to feedingstuffs by such mixtures is lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or category of animal.</li> <li>For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</li> </ol>	12 September 2032
			Laying hens and minor poultry species for laying and breeding	—	—	172		
			Turkeys for fattening	—	—	144		
			All <i>Suidae</i> species for fattening	—	—	200		
			Piglets of all <i>Suidae</i> species	—	—	130		
			Sows of all <i>Suidae</i> species	—	—	230		
			Ruminants	—	—			
Horses	—	—						

		<p><i>Analytical method</i> <sup>(3)</sup></p> <p>For the determination of d-limonene (phytochemical marker) in the feed additive:</p> <p>— gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 3140)</p>	<p>Other animal species and categories except dogs, cats, ornamental fish and ornamental birds</p>	—	—	50		
--	--	---	--	---	---	----	--	--

<sup>(1)</sup> Synonyms: *Citrus sinensis* (L.) Pers., *Citrus aurantium* (L.) Dulcis.

<sup>(2)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(3)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Additive	Composition, chemical formula, description, analytical method.	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
					mg active substance/kg of complete feed with a moisture content of 12 %			
<b>Category: Sensory additives. Functional group: Flavouring compounds</b>								
2b143-di	Distilled orange essential oil	<p><i>Additive composition</i></p> <p>Distillate (volatile fraction) of orange essential oil, which is obtained from fruit peel of <i>Citrus sinensis</i> (L.) Osbeck.</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Volatile fraction from the distillation of orange essential oil expressed (cold pressed), which is obtained from the fruit peel of <i>Citrus sinensis</i> (L.) Osbeck as defined by the Council of Europe (1).</p> <p>d-Limonene: 93-97,5 %</p> <p>Myrcene: 1,5-3,5 %</p> <p>Sabinene: 0,2-1,0 %</p> <p>α-Pinene: 0,3-0,8 %</p>	Chickens for fattening and minor poultry species for fattening	—	—	80	<p>1. The additive shall be incorporated into the feed in the form of a premixture.</p> <p>2. In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</p> <p>3. Mixture with other botanical additives is permitted provided that the amounts of perillaldehyde added to feedingstuffs by such mixtures is lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or category of animals.</p>	12 September 2032
			Laying hens and minor poultry species for laying and breeding	—	—	200		
			Turkeys for fattening	—	—	130		
			<i>Suidae</i>	—	—	225		
			Ruminants	—	—			
			Horses	—	—			

	<p>Linalool: 0,05-0,5 %                  Octanal: 0,05-0,4 %                  Perillaldehyde: &lt; 0,005 %                  CAS number: 8028-48-6                  CoE number: 143</p> <p><i>Analytical method</i> <sup>(2)</sup></p> <p>For the determination of d-limonene (phytochemical marker) in the feed additive:</p> <p>— gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 3140)</p>	<p>Other animal species and categories except dogs, cats, ornamental fish and ornamental birds</p>	—	—	80	<p>4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</p>	
--	--	--	---	---	----	--	--

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Additive	Composition, chemical formula, description, analytical method.	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
					mg active substance/kg of complete feed with a moisture content of 12 %			
<b>Category: Sensory additives. Functional group: Flavouring compounds</b>								
2b143-f	Folded orange oil	<p><i>Additive composition</i></p> <p>Folded oil obtained from the fruit peel of <i>Citrus sinensis</i> (L.) Osbeck.</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Folded oil produced by the fractional distillation of an expressed orange essential oil obtained from the fruit peel of <i>Citrus sinensis</i> (L.) Osbeck as defined by the Council of Europe <sup>(1)</sup>.</p> <p>Non-volatile fraction: 10,5 %</p> <p>In the volatile fraction:</p> <p>d-Limonene: 89-96 %</p> <p>Decanal: 0,5-2 %</p> <p>Linalool: 0,7-1,7 %</p> <p>Myrcene: 0,1-1,0 %</p> <p>Geranial: 0,1-1,0 %</p> <p>Perillaldehyde: &lt; 0,3 %</p> <p>CAS number: 8028-48-6</p> <p>FEMA number: 2822</p>	Chickens for fattening and minor poultry species for fattening	—	—	15,5	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>Mixture with other botanical additives is permitted provided that the amounts of perillaldehyde added to feedingstuffs by such mixtures is lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or category of animals.</li> </ol>	12 September 2032
			Laying hens and minor poultry species for laying and breeding	—	—	23,5		
			Turkeys for fattening	—	—	21		
			All <i>Suidae</i> for fattening	—	—	34		
			Piglets of all <i>Suidae</i> species	—	—	28,5		
			Sows of all <i>Suidae</i> species	—	—	41,5		
			Calves (milk replacer)	—	—	66,5		

<p><i>Analytical method</i> <sup>(2)</sup></p> <p>For the determination of d-limonene (phytochemical marker) in the feed additive:</p> <p>— gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 3140)</p>	Sheep and goats	—	—	62,5	<p>4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</p>
	Other ruminants for fattening				
	Dairy ruminants other than dairy sheep and dairy goats	—	—	40,5	
	Horses	—	—	62,5	
	Rabbits	—	—	25	
	Fish except ornamental fish	—	—	70	
Other animal species and categories except dogs, cats, ornamental fish and ornamental birds	—	—	15,5		

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Additive	Composition, chemical formula, description, analytical method.	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
					mg active substance/kg of complete feed with a moisture content of 12 %			
<b>Category: Sensory additives. Functional group: Flavouring compounds</b>								
2b143-f-i	Folded orange oil	<p><i>Additive composition</i></p> <p>Folded oil obtained from the fruit peel of <i>Citrus sinensis</i> (L.) Osbeck.</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Folded oil produced by the fractional distillation of an expressed orange essential oil obtained from the fruit peel of <i>Citrus sinensis</i> (L.) Osbeck as defined by the Council of Europe <sup>(1)</sup>.</p> <p>Non-volatile fraction: 20,9 %</p> <p>In the volatile fraction:</p> <p>d-Limonene: 79-89 %</p> <p>Decanal: 3,0-5,0 %</p> <p>Linalool: 2,0-5,0 %</p> <p>Myrcene: 0,1-1,0 %</p> <p>Geranial: 0,5-1,8 %</p> <p>Perillaldehyde: &lt; 0,6 %</p> <p>CAS number: 8028-48-6</p> <p>FEMA number: 2822</p>	Chickens for fattening and minor poultry species for fattening	—	—	5,5	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>Mixture with other botanical additives is permitted provided that the amounts of perillaldehyde added to feedingstuffs by such mixtures is lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or category of animals.</li> </ol>	12 September 2032
			Laying hens and minor poultry species for laying and breeding	—	—	8		
			Turkeys for fattening	—	—	7		
			All <i>Suidae</i> for fattening	—	—	11,5		
			Piglets of all <i>Suidae</i> species	—	—	9,5		
			Sows of all <i>Suidae</i> species	—	—	14		
			Calves (milk replacer)	—	—	23		

<p><i>Analytical method</i> <sup>(?)</sup></p> <p>For the determination of d-limonene (phytochemical marker) in the feed additive:</p> <p>— gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 11024)</p>	Sheep and goats	—	—	21,5	<p>4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</p>
	Other ruminants for fattening				
	Dairy ruminants other than dairy sheep and dairy goats	—	—	14	
	Horses	—	—	21,5	
	Rabbits	—	—	8,5	
	Fish except ornamental fish	—	—	24,5	
Other animal species and categories except dogs, cats, ornamental fish and ornamental birds	—	—	5,5		

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Additive	Composition, chemical formula, description, analytical method.	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
					mg active substance/kg of complete feed with a moisture content of 12 %			
<b>Category: Sensory additives. Functional group: Flavouring compounds</b>								
2b143-f-ii	Folded orange oil	<p><i>Additive composition</i></p> <p>Folded oil obtained from the fruit peel of <i>Citrus sinensis</i> (L.) Osbeck.</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Folded oil produced by the fractional distillation of an expressed orange essential oil which is obtained from the fruit peel of <i>Citrus sinensis</i> (L.) Osbeck as defined by the Council of Europe (1).</p> <p>Non-volatile fraction: 18 %</p> <p>In the volatile fraction:</p> <p>d-Limonene: 85-95 %</p> <p>Linalool: 0,5-4 %</p> <p>CAS number: 8028-48-6</p> <p>FEMA number: 2822</p>	All animal species except horses, rabbits, dogs, cats, ornamental fish and ornamental birds	—	—	—	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>On the label of the additive the following shall be indicated: <ul style="list-style-type: none"> <li>Recommended maximum content of the active substance per kg of complete feedingstuff with a moisture content of 12 %: <ul style="list-style-type: none"> <li>Chickens for fattening and minor poultry species for fattening, laying hens and minor poultry species for laying and breeding, turkeys for fattening, <i>Suidae</i>: 50 mg;</li> <li>Calves (milk replacer), sheep, goats: 70 mg;</li> </ul> </li> </ul> </li> </ol>	12 September 2032

		<p><i>Analytical method</i> <sup>(2)</sup></p> <p>For the determination of d-limonene (phytochemical marker) in the feed additive:</p> <ul style="list-style-type: none"> <li>— gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 3140)</li> </ul>					<ul style="list-style-type: none"> <li>— Ruminants except sheep and goats: 60 mg;</li> <li>— Other animal species and categories except horses, rabbits, dogs, cats, ornamental fish and ornamental birds: 2 mg'.</li> </ul> <p>4. The functional group, the identification number, the name and the added amount of the active substance shall be indicated on the label of the premixture where the use level on the label of the premixture would result in exceeding the level referred to in point 3.</p> <p>5. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</p>
--	--	--	--	--	--	--	---

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Name of the holder of authorisation	Additive	Composition, chemical formula, description, analytical method.	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
						mg active substance/kg of complete feed with a moisture content of 12 %			

**Category: Sensory additives. Functional group: Flavouring compounds**

2b136-ex	—	Bitter orange extract	<p><i>Additive composition</i></p> <p>Bitter orange extract from the fruit of <i>Citrus x aurantium</i> L.</p> <p>Solid form</p> <p><i>Characterisation of the active substance</i></p> <p>Bitter orange extract from the fruit of <i>Citrus x aurantium</i> L. as defined by the Council of Europe (1).</p> <p>Flavonoids: 45-55 % of which</p> <ul style="list-style-type: none"> <li>— Naringin: 20-30 %</li> <li>— Neohesperidin: 10-20 %</li> </ul> <p>5-methoxypsoralen (also known as bergapten): ≤ 0,03 %</p> <p>(-)-Synephrine: ≤ 1 %</p> <p>CoE number: 136</p>	All animal species except dogs, cats, ornamental fish and ornamental birds	—	—		<ol style="list-style-type: none"> <li>1. The additive shall be incorporated into the feed in the form of a premixture.</li> <li>2. In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>3. On the label of the additive the following shall be indicated: <ul style="list-style-type: none"> <li>'Recommended maximum content of the active substance per kg of complete feedingstuff with a moisture content of 12 %:</li> <li>— Chickens for fattening and minor poultry species for fattening: 102 mg;</li> <li>— Laying hens and minor poultry species for laying or breeding: 151 mg;</li> <li>— Turkeys for fattening: 136 mg;</li> </ul> </li> </ol>	11 May 2032
----------	---	-----------------------	---	--	---	---	--	--	-------------

			<p><i>Analytical method</i> <sup>(2)</sup></p> <p>For the quantification of naringin (phytochemical marker) in the feed additive:</p> <ul style="list-style-type: none"> <li>— High performance liquid chromatography (HPLC) with spectrophotometric (UV) detection</li> </ul>					<ul style="list-style-type: none"> <li>— Piglets of all <i>Suidae</i> species: 182 mg;</li> <li>— All <i>Suidae</i> for fattening: 217 mg;</li> <li>— Sows of all <i>Suidae</i> species: 268 mg;</li> <li>— Dairy ruminants other than dairy sheep and dairy goats: 259 mg;</li> <li>— Calves (milk replacer), sheep, goats, other ruminants for fattening, horses, salmonids and all other fin fish: 400 mg;</li> <li>— Rabbits: 161 mg;</li> <li>— Other animal species and categories except dogs, cats, ornamental fish and ornamental birds: 102 mg'.</li> </ul> <p>4. The functional group, the identification number, the name and the added amount of the active substance shall be indicated on the label of the premixture where the use level on the label of the premixture would result in exceeding the level referred to in point 3.</p>	
--	--	--	--	--	--	--	--	---	--

									<p>5. Mixture of bitter orange extract with other botanical additives is permitted provided that the amounts of 5-methoxypsoralen and (-)-synephrine in feed materials and compound feed are lower than the ones resulting from the use of a single additive at the maximum or recommended level for the species or animal category.</p> <p>6. The mixture of bitter orange extract from the fruit of <i>Citrus x aurantium</i> L. with other authorised additives obtained from <i>Citrus aurantium</i> L. shall not be allowed in feedingstuffs.</p> <p>7. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</p>
--	--	--	--	--	--	--	--	--	---

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Name of the holder of authorisation	Additive	Composition, chemical formula, description, analytical method	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
						mg active substance/kg of complete feed with a moisture content of 12 %			
<b>Category: Sensory additives. Functional group: Flavouring compounds</b>									
2b139-eo	—	Expressed lemon essential oil	<p><i>Additive composition</i></p> <p>Expressed lemon essential oil from fruit peel of <i>Citrus limon</i> (L.) Osbeck</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Expressed lemon essential oil obtained by cold expression from fruit peel of <i>Citrus limon</i> (L.) Osbeck as defined by the Council of Europe (1)</p> <p>d-Limonene: 60–73 %</p> <p>β-Pinene (pin-2(10)-ene): 9–18 %</p> <p>γ-Terpinene: 6–12 %</p> <p>α-Pinene (pin-2(3)-ene): 1,3–3,0 %</p> <p>Sabinene (4(10)-thujene): 0,3–3,0 %</p> <p>Geranial: 0,1–2,0 %</p> <p>Neral: 0,1–1,8 %</p> <p>Perillaldehyde: ≤ 0,023 %</p> <p>Furocoumarins: ≤ 0,3 %</p> <p>Methoxycoumarins: ≤ 0,06 %</p>	Chickens for fattening and minor poultry species for fattening	—	—	35	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>Mixture of expressed lemon essential oil with other botanical additives is permitted provided that the amounts of perillaldehyde, furocoumarins, and methoxycoumarins in feed materials and compound feed are lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or animal category.</li> </ol>	29 September 2032
				Turkeys for fattening			40		
				Salmonids and other fin fish except ornamental fish			52		
				Laying hens and minor poultry species for laying or breeding			74		
				All <i>Suidae</i> for fattening					

		CAS number 84929-31-7 FEMA number 2625 CoE number: 139 <i>Analytical method</i> <sup>(2)</sup> For the quantification of phytochemical marker <i>d-limonene</i> in the feed additive: — Gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 855)	Piglets of all <i>Suidae</i> species		62	4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment,.
			Sows of all <i>Suidae</i> species		92	
			Calves (milk replacers) Ruminants for fattening other than sheep and goats Dairy ruminants other than sheep and goats		90	
			Horses		137	
			Other animal species and categories except dogs, cats, ornamental fish and ornamental birds		30	

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Name of the holder of authorisation	Additive	Composition, chemical formula, description, analytical method	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
						mg active substance/kg of complete feed with a moisture content of 12 %			

**Category: Sensory additives. Functional group: Flavouring compounds**

2b139- rf	—	Residual fraction of expressed lemon oil distilled	<p><i>Additive composition</i></p> <p>Residual fraction of expressed lemon oil distilled from fruit peel of <i>Citrus limon</i> (L.) Osbeck</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Residual fraction of expressed lemon oil distilled obtained by the distillation of lemon essential oil expressed from fruit peel of <i>Citrus limon</i> (L.) Osbeck as defined by the Council of Europe <sup>(1)</sup></p>	Chickens for fattening and minor poultry species for fattening	—	—	11	<p>1. The additive shall be incorporated into the feed in the form of a premixture.</p> <p>2. In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</p> <p>3. Mixture of residual fraction of expressed lemon oil distilled with other botanical additives is permitted provided that the amounts of perillaldehyde, furocoumarins, and methoxycoumarins in feed materials and compound feed are lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or animal category.</p>	29 September 2032
				Laying hens and minor poultry species for laying or breeding			12		
				Turkeys for fattening			20		
				Rabbits					
				Salmonids and other fin fish except ornamental fish					
				Ruminants					

		<p>The specifications of the active substance are:</p> <p>d-Limonene: 51–63 %</p> <p>γ-Terpinene: 8–17 %</p> <p>Geranial: 6–12 %</p> <p>Neral: 5–9 %</p> <p>β-Pinene (pin-2(10)-ene): 0,3–5,5 %</p> <p>β-Bisabolene: 0,3–4 %</p> <p>Perillaldehyde: ≤ 0,092 %</p> <p>Furocoumarins: ≤ 0,8 %</p> <p>Methoxycoumarins: ≤ 0,22 %</p> <p>CoE number: 139</p> <p><i>Analytical method</i> <sup>(2)</sup></p> <p>For the quantification of phytochemical marker <i>d-limonene</i> in the feed additive:</p> <p>— Gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 855)</p>	Piglets of all <i>Suidae</i> species			20	<p>4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</p>	
			All <i>Suidae</i> for fattening			24		
			Sows of all <i>Suidae</i> species			30		
			Horses			35		
			Other animal species and categories except dogs, cats, ornamental fish and ornamental birds			11		

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Name of the holder of authorisation	Additive	Composition, chemical formula, description, analytical method	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
						mg active substance/kg of complete feed with a moisture content of 12 %			
<b>Category: Sensory additives. Functional group: Flavouring compounds</b>									
2b139-di	—	Distilled lemon essential oil (volatile fraction)	<p><i>Additive composition</i></p> <p>Distilled lemon essential oil (volatile fraction) obtained from lemon essential oil expressed from fruit peel of <i>Citrus limon</i> (L.) Osbeck</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Distilled lemon essential oil (volatile fraction) obtained by lemon essential oil expressed from fruit peel of <i>Citrus limon</i> (L.) Osbeck as defined by the Council of Europe (1)</p> <p>The specifications of the active substance are:</p> <p>d-Limonene: 66–78 %</p> <p>β-Pinene (pin-2(10)-ene): 5–20 %</p> <p>γ-Terpinene: 1,5–9,5 %</p> <p>α-Pinene (pin-2(3)-ene): 0,5–3,0 %</p> <p>Sabinene: 0,3–3,0 %</p> <p>Furocoumarins: ≤ 0,1 mg/kg</p> <p>Methoxycoumarins: ≤ 0,1 mg/kg</p>	Chickens for fattening and minor poultry species for fattening	—	—	36	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>Mixture of distilled lemon essential oil (volatile fraction) with other botanical additives is permitted provided that the amounts of furocoumarins, and methoxycoumarins in feed materials and compound feed are lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or animal category.</li> </ol>	29 September 2032
				Laying hens and minor poultry species for laying or breeding			53		
				Rabbits			56		
				Turkeys for fattening			48		
				Piglets of all <i>Suidae</i> species			64		
				All <i>Suidae</i> for fattening			76		
				Sows of all <i>Suidae</i> species			94		

		CoE number: 139	Calves (milk replacers)			95	4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.		
		<i>Analytical method</i> <sup>(2)</sup>	Sheep and goats			141			
		For the quantification of phytochemical marker <i>d-limonene</i> in the feed additive:	Other ruminants for fattening			91			
		— Gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 855)	Horses			60			
			Dairy ruminants other than sheep and goats			30			
			Salmonids, ornamental fish and all other fin fish						
			Dogs						
			Other animal species and categories						

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

Identification number of the additive	Name of the holder of authorisation	Additive	Composition, chemical formula, description, analytical method	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
						mg active substance/kg of complete feed with a moisture content of 12 %			

**Category: Sensory additives. Functional group: Flavouring compounds**

2b141-eo	—	Distilled lime essential oil	<p><i>Additive composition</i></p> <p>Distilled lime essential oil obtained by unpeeled fruits of the plant species <i>Citrus aurantiifolia</i> (Christm.) Swingle</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Distilled lime essential oil obtained by steam distillation from unpeeled fruits of the plant species <i>Citrus aurantiifolia</i> (Christm.) Swingle as defined by the Council of Europe (1)</p> <p>The specifications of the active substance are:</p> <p>d-Limonene: 45–52 %</p> <p>γ-Terpinene: 10–14 %</p> <p>Terpinolene: 5,5–10,5 %</p> <p>αTerpineol: 6–8 %</p> <p>β-Caryophyllene: 0,2–0,8 %</p> <p>Furocoumarins: ≤ 0,0083 %</p> <p>Methoxycoumarins: ≤ 0,03 %</p>	Chickens for fattening and minor poultry species for fattening	—	—	8,5	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>Mixture of distilled lime essential oil with other botanical additives is permitted provided that the amounts of furocoumarins, and methoxycoumarins in feed materials and compound feed are lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or animal category.</li> </ol>	29 September 2032
				Laying hens and minor poultry species for laying or breeding			12,5		
				Turkeys for fattening			11		
				Piglets of all <i>Suidae</i> species			15		
				All <i>Suidae</i> for fattening			18		
				Lactating sows of all <i>Suidae</i> species			22		

			CoE number:141  <i>Analytical method</i> <sup>(2)</sup> For the quantification of phytochemical marker <i>d-limonene</i> in the feed additive: — Gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 3519)	Sheep and goats Other ruminants for fattening Horses			33,5	4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.	
				Calves (milk replacers)			35,5		
				Dairy ruminants other than sheep and goats			21,5		
				Rabbits			13,5		
				Salmonids and other fin fish except ornamental fish			30		
				Other animal species and categories except dogs, cats, ornamental fish and ornamental birds			8,5		

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007).

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>

## ANNEX IV

Identification number of the additive	Name of the holder of authorisation	Additive	Composition, chemical formula, description, analytical method.	Species or category of animal	Maximum age	Minimum content	Maximum content	Other provisions	End of period of authorisation
						mg active substance/kg of complete feed with a moisture content of 12 %			

**Category: Sensory additives. Functional group: Flavouring compounds**

2b142-eo	—	Expressed mandarin essential oil	<p><i>Additive composition</i></p> <p>Mandarin essential oil obtained from fruit peel of <i>Citrus reticulata</i> Blanco.</p> <p>Liquid form</p> <p><i>Characterisation of the active substance</i></p> <p>Expressed mandarin essential oil obtained by cold expression from fruit peel of <i>Citrus reticulata</i> Blanco as defined by the Council of Europe <sup>(1)</sup>.</p> <p>d-Limonene: 65–80 %</p> <p>γ-Terpinene: 13-22 %</p> <p>α-Pinene (pin-2(3)-ene): 1-3,5 %</p> <p>Myrcene:1-2 %</p> <p>β-Pinene (pin-2(10)-ene): 1-2 %.</p> <p>Methyl N-methyl anthranilate: 0,15-0,7 %</p> <p>Perillaldehyde: ≤ 0,063 %</p>	Poultry	—	—	15	<ol style="list-style-type: none"> <li>The additive shall be incorporated into the feed in the form of a premixture.</li> <li>In the directions for use of the additive and premixtures, the storage conditions and stability to heat treatment shall be indicated.</li> <li>Mixture of expressed mandarin essential oil with other botanical additives is permitted provided that the amounts of perillaldehyde in feed materials and compound feed are lower than the one resulting from the use of a single additive at the maximum or recommended level for the species or animal category.</li> </ol>	20 March 2032
				Rabbits	—	—	33		
				Salmonids	—	—	30		
				<i>Suidae</i>	—	—	40		
				Ruminants	—	—	15		
			Horses	—	—	40			
			Other animal species and categories except dogs, cats, ornamental fish and ornamental birds	—	—	15			

			<p>CAS number: 8008-31-9</p> <p>FEMA number: 2657</p> <p>CoE number: 142</p> <p><i>Analytical method</i> <sup>(2)</sup></p> <p>For the quantification of phytochemical marker <i>d-limonene</i> in the feed additive:</p> <p>— Gas chromatography coupled with flame ionisation detection (GC-FID) (based on ISO 3528)</p>					<p>4. For users of the additive and premixtures, feed business operators shall establish operational procedures and organisational measures to address potential risks by inhalation, dermal contact or eyes contact. Where those risks cannot be eliminated by such procedures and measures, the additive and premixtures shall be used with personal skin, eye and breathing protective equipment.</p>	
--	--	--	--	--	--	--	--	--	--

<sup>(1)</sup> Natural sources of flavourings – Report No 2 (2007)

<sup>(2)</sup> Details of the analytical methods are available at the following address of the Reference Laboratory: <https://ec.europa.eu/jrc/en/eurl/feed-additives/evaluation-reports>