Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products

**PRODUCT ASSESSMENT REPORT OF A BIOCIDAL PRODUCT FOR RENEWAL OF NATIONAL AUTHORISATION APPLICATIONS**



FANGA PATE 25

Product type 14

Brodifacoum

Case Numbers in R4BP: BC-XE049434-33

Evaluating Competent Authority: France

Date : August 2014

Updated : August 2019

Contents

[0- History of the dossier (updated PAR – 2019) 6](#_Toc523232357)

[1 General information about the product application (initial PAR – 2014) 9](#_Toc523232358)

[1.1 Applicant 9](#_Toc523232359)

[1.1.1 Person authorised for communication on behalf of the applicant 9](#_Toc523232360)

[1.2 Proposed authorisation holder 9](#_Toc523232361)

[1.3 Information about the product application 9](#_Toc523232362)

[1.4 Information about the biocidal product 10](#_Toc523232363)

[1.4.1 General information 10](#_Toc523232364)

[1.4.2 Information on the intended use(s) 10](#_Toc523232365)

[1.4.3 Information on active substance 13](#_Toc523232366)

[1.4.4 Information on the substance(s) of concern 14](#_Toc523232367)

[1.5 Documentation 15](#_Toc523232368)

[1.5.1 Data submitted in relation to product application 15](#_Toc523232369)

[1.5.2 Access to documentation 17](#_Toc523232370)

[2 Summary of the product assessment 18](#_Toc523232371)

[2.1 Identity related issues –PAR 2014 18](#_Toc523232372)

[2.2 Classification, labelling and packaging 18](#_Toc523232373)

[2.2.1 Harmonised classification of the active substance 18](#_Toc523232374)

[2.2.2 Classification of the biocidal product 19](#_Toc523232375)

[2.2.3 Labelling of the biocidal product 20](#_Toc523232376)

[2.2.4 Packaging of the biocidal product 20](#_Toc523232377)

[2.3 Physico/chemical properties and analytical methods 23](#_Toc523232378)

[2.3.1 Active ingredient 23](#_Toc523232379)

[2.3.1.1 Identity, origin of active ingredient-PAR - 2014 23](#_Toc523232380)

[2.3.1.2 Physico-chemical properties – 23](#_Toc523232381)

[2.3.1.3 Analytical method for determination of active ingredient and impurities in the technical active ingredient-PAR - 2014 23](#_Toc523232382)

[2.3.1.4 Analytical method for determining relevant components and/or residues in different matrices 24](#_Toc523232383)

[2.3.2 Biocidal product 24](#_Toc523232384)

[2.3.2.1 Identity, composition of the biocidal product, packaging-PAR 2014 24](#_Toc523232385)

[2.3.2.2 Physico-chemical properties 24](#_Toc523232386)

[2.3.3 Analytical methods for detection and identification 39](#_Toc523232387)

[2.3.3.1 Analytical method for determining the active substance and relevant component in the biocidal product 39](#_Toc523232388)

[2.4 Risk assessment for Physico-chemical properties 43](#_Toc523232389)

[2.5 Effectiveness against target organisms 45](#_Toc523232390)

[2.5.1 Function 45](#_Toc523232391)

[2.5.2 Organisms to be controlled and products, organisms or objects to be protected 45](#_Toc523232392)

[2.5.3 Effect on target organisms and efficacy- 45](#_Toc523232393)

[2.5.4 Mode of action including time delay- PAR 2014 49](#_Toc523232394)

[2.5.5 Occurrence of resistance - resistance management / Unacceptable effect 49](#_Toc523232395)

[2.5.6 Evaluation of the label claim 53](#_Toc523232396)

[2.5.7 Conclusion of the efficacy assessment 54](#_Toc523232397)

[2.6 Description of the intended use 55](#_Toc523232398)

[2.7 Risk assessment for human health 56](#_Toc523232399)

[2.7.1 Hazard potential – initial PAR 2014, updated 2017 56](#_Toc523232400)

[2.7.1.1 Toxicology of the active substance 56](#_Toc523232401)

[2.7.1.2 Toxicology of the substance(s) of concern 63](#_Toc523232402)

[2.7.1.3 Toxicology of the biocidal product 63](#_Toc523232403)

[2.7.2 Human exposure assessment -PAR 2014 66](#_Toc523232404)

[2.7.2.1 Identification of main paths of human exposure towards active substance from its use in biocidal product 66](#_Toc523232405)

[2.7.2.2 Direct exposure as a result of use of the active substance in biocidal product 66](#_Toc523232406)

[2.7.2.3 Indirect exposure as a result of use of the active substance in biocidal product 68](#_Toc523232407)

[2.7.2.4 Exposure to residues in food 68](#_Toc523232408)

[2.7.2.5 Combined exposure 68](#_Toc523232409)

[2.7.3 Risk assessment for human health – PAR 2014 73](#_Toc523232410)

[2.7.3.1 Risk for direct exposure 73](#_Toc523232411)

[2.7.3.2 Risk for indirect exposure 73](#_Toc523232412)

[2.7.3.3 Risk for consumers via residues 74](#_Toc523232413)

[2.7.3.4 Risk for combined exposure 74](#_Toc523232414)

[2.7.3.5 Conclusion on human health risk assessment 74](#_Toc523232415)

[2.7.4 Human exposure assessment (revised human exposure assessment -major change 2016) **Erreur ! Signet non défini.**](#_Toc523232416)

[2.7.4.1 Identification of main paths of human exposure towards active substance from its use in biocidal product **Erreur ! Signet non défini.**](#_Toc523232417)

[2.7.4.2 Direct exposure as a result of use of the active substance in biocidal product **Erreur ! Signet non défini.**](#_Toc523232418)

[2.7.5 Human exposure assessment (revised human exposure assessment -major change application 2017) **Erreur ! Signet non défini.**](#_Toc523232419)

[2.7.5.1 Direct exposure as a result of use of the active substance in biocidal product **Erreur ! Signet non défini.**](#_Toc523232420)

[2.7.5.2 Indirect exposure as a result of use of the active substance in biocidal product **Erreur ! Signet non défini.**](#_Toc523232421)

[2.7.6 Risk assessment for human health (revised risk assessment for human health - major change 2016) 75](#_Toc523232422)

[2.7.6.1 Risk for direct exposure 75](#_Toc523232423)

[2.7.7 Summary of risks characterisation of the product for human health 75](#_Toc523232424)

[2.7.8 Risk assessment for human health (Major change application 2017) 76](#_Toc523232425)

[2.7.8.1 Risk for direct exposure 76](#_Toc523232426)

[2.7.8.2 Risk for indirect exposure 76](#_Toc523232427)

[2.7.8.3 Conclusion on human health risk assessment – Major change al application 2017 76](#_Toc523232428)

[2.8 Risk assessment for the environment 77](#_Toc523232429)

[2.8.1 Fate and distribution in the environment of the active substance brodifacoum-PAR 2014 77](#_Toc523232430)

[2.8.1.1 Degradation 77](#_Toc523232431)

[2.8.1.2 Distribution 78](#_Toc523232432)

[2.8.1.3 Accumulation 78](#_Toc523232433)

[2.8.1.4 Behaviour in air 78](#_Toc523232434)

[2.8.2 Effects on environmental organisms for active substance brodifacoum 79](#_Toc523232435)

[2.8.2.1 Aquatic compartment (including water, sediment and STP) 79](#_Toc523232436)

[2.8.2.2 Atmosphere 80](#_Toc523232437)

[2.8.2.3 Terrestrial compartment 80](#_Toc523232438)

[2.8.2.4 Non compartment specific effect relevant to the food chain 81](#_Toc523232439)

[2.8.2.5 Summary of PNECs of the active substance Brodifacoum 83](#_Toc523232440)

[2.8.2.6 PBT Assessment 84](#_Toc523232441)

[2.8.3 Effects on environmental organisms for biocidal product 84](#_Toc523232442)

[2.8.3.1 Aquatic compartment (including water, sediment and STP) 84](#_Toc523232443)

[2.8.3.2 Atmosphere 84](#_Toc523232444)

[2.8.3.3 Terrestrial compartment 84](#_Toc523232445)

[2.8.3.4 Non compartment specific effect relevant to the food chain 84](#_Toc523232446)

[2.8.3.5 Summary of PNECs 84](#_Toc523232447)

[2.8.4 Environmental exposure assessment –PAR 2014 85](#_Toc523232448)

[2.8.4.1 Aquatic compartment (surface water, sediment, STP) 85](#_Toc523232449)

[2.8.4.2 Atmospheric compartment 85](#_Toc523232450)

[2.8.4.3 Terrestrial compartment (soil and groundwater) 86](#_Toc523232451)

[2.8.4.4 Non-compartmental-specific exposure relevant to the food chain (secondary poisoning) 90](#_Toc523232452)

[2.8.5 Risk characterisation for the environment –PAR - 2014 99](#_Toc523232453)

[2.8.5.1 Primary poisoning 99](#_Toc523232454)

[2.8.5.2 Secondary poisoning 101](#_Toc523232455)

[2.8.5.3 Conclusion of the risk assessment for the environment 102](#_Toc523232456)

[2.8.6 Environmental exposure assessment (revised Environmental exposure assessment section during the major change application 2016) **Erreur ! Signet non défini.**](#_Toc523232457)

[2.8.6.1 Aquatic compartment (surface water, sediment, STP) **Erreur ! Signet non défini.**](#_Toc523232458)

[2.8.6.2 Atmospheric compartment **Erreur ! Signet non défini.**](#_Toc523232459)

[2.8.6.3 Terrestrial compartment (soil and groundwater) **Erreur ! Signet non défini.**](#_Toc523232460)

[2.8.6.4 Non-compartmental-specific exposure relevant to the food chain (secondary poisoning) **Erreur ! Signet non défini.**](#_Toc523232461)

[2.8.6.5 Risk characterisation for the environment (revised risk characterisation for the environment section during the major change application 2016) **Erreur ! Signet non défini.**](#_Toc523232462)

[2.9 Measures to protect man, animals and the environment 111](#_Toc523232463)

[3 Erreur ! Signet non défini.](#_Toc523232464)

[Proposal for decision – Renewal application 2019 112](#_Toc523232465)

[4 Appendices 130](#_Toc523232466)

[Annex 1: List of studies reviewed: List of new datasubmitted in support of the evaluation of the active substance 130](#_Toc523232467)

[*Not applicapble* 130](#_Toc523232468)

[Annex 2: List of studies reviewed: List of new data submitted in support of the evaluation of the biocidal product – PAR 2014, updated 2017 130](#_Toc523232469)

[Annex 3: Analytical methods residues – active substance (initial PAR 2014) 137](#_Toc523232470)

[Annex 4: Toxicology and metabolism –active substance 141](#_Toc523232471)

[Annex 5: Toxicology – biocidal product 142](#_Toc523232472)

[Annex 7: Safety for non-professional operators and the general public 144](#_Toc523232473)

[Annex 8: Residue behaviour 145](#_Toc523232474)

[Annex 9: Efficacy of the active substance from its use in the biocidal product for FANGA PATE PRO (initial PAR -2014) 146](#_Toc523232475)

**Note to the reader:**

This consolidated PAR for the renewal of the product authorisation FANGA PATE 25 is based on the PAR of the first authorisation FANGA PATE PRO granted by FR CA on 2014, in which all addenda have been included.

In part 1 and 2 of this consolidated PAR:

⁻ each section contains the initial assessment and the subsequent successive assessments (major change and post authorisation data) in a chronological order . These assessments are pointed out with specific titles corresponding to the type of application and the year at which they were delivered.

⁻ the assessments related to the renewal of the product are indicated at the end of each section and are highlighted in grey.

In part 3 of the consolidated PAR “proposal for decision”: the summary of product characteristics is pointed out and corresponds to the decision for the minor change.

**Disclaimer regarding user category**

For the risk assessment of PT14, two user categories have been addressed depending on the quantity of manipulated product and the possibility of using PPE: non-professional users and professional users.

In France, any professional user needs a dedicated national certificate, hence it is expected that he/she has the required competence to access to biocidal products that are authorized for professional users they are thus considered as « trained professional users ».

Consequently, in the SPC for the major change in Part 3, uses for “professionals” are mentioned according to the agreed standard SPC, but they are not relevant in France. In case of mutual recognitions, it is proposed that each cMS adapts the conditions of authorization of the product according to its own legislation.

# History of the dossier

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Application type** | **refMS** | **Case number in the refMS** | **Decision date** | **Assessment carried out (i.e. first authorisation / amendment** |
| NA-APP | FR | 2012/619/287/FR/APPFF/7 | 04/08/2014 | Initial assessment  FANGA PATE PRO |
| NA-ADC | FR | BC-JG015551-55 | 15/07/2015 | Addition of others trades names and manufacturers of the product |
| NA-MAC | FR | BC-LF017851-47 | 26/05/2016 | Major change application for FANGA PATE PRO |
| NA-BBS | FR | BC-FD025767-46 | 18/08/2017 | Same authorisation for FANGA PATE 25 |
| NA-MAC | FR | BC-EQ033156-36 | 16/03/2018 | Major change application for FANGA PATE 25 |
| NA-MIC | FR | BC-LE039335-47 | 14/09/2018 | Minor change application for FANGA PATE 25 |
| NA-RNL | FR | BC-XE049434-33 | 11/10/2019 | Renewal application for FANGA PATE 25 |

**Authorised uses (0.0025 % of brodifacoum) – 2018**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Users** | **Target organisms** | **Application rate** | **Field of use** | **Packagings** |
| Professionals  users | Rat (*Rattus norvegicus and rattus rattus*) | 100 g of product /bait station separated to 5-10 m meters | In and around buildings  Open areas  Waste dumps and landfills | Minimum pack size : 3 kg  (*In France only 5 kg*) |
| Mice (*Mus musculus*) | 30 g of product / bait station at separated to 1-2 m meters |
| Non professionnals | Rat (*R*attus *norvegicus and rattus rattus*) | 100 g / bait point separated by 5-10 meters | In and around buildings  Open areas | Minimum pack size : 3 kg  (*In France only 5 kg*) |
| Mice (*Mus musculus*) | 30 g / bait point separated by 1-2 meters | Indoor |

**Intended uses for renewal (0.0025% of brodifacoum) – 2019**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Users** | **Target organisms** | **Application rate** | **Field of use** | **Packagings** |
| Professionals  users | Rat (*Rattus norvegicus and rattus rattus*) | 100 g of product /bait station separated to 5-10 m meters | In and around buildings  Open areas  Waste dumps and landfills | Minimum pack size : 3 kg  (*In France only 5 kg*) |
| Mice (*Mus musculus*) | 30 g of product / bait station at separated to 1-2 m meters |
| Non professionnals | Rat (*R*attus *norvegicus and rattus rattus*) | 100 g / bait point separated by 5-10 meters | In and around buildings | Minimum pack size : 3 kg  (*In France only 5 kg*) |
| Mice (*Mus musculus*) | 30 g / bait point separated by 1-2 meters | Indoor |

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| The major change consists of:   * a reduction of brodifacoum concentration in the product ( from 0.005% to 0.0025%); * the addition of the non-professional category of users; * the reduction of concentration of co-formulants (Triethanolamine from 0.086% to 0.043% ; Polyethylen glycol from 0.793% to 0.491% ; Monopropylen glycol from 0.793% to 0.419%); * augmentation of wheat flour concentration from 71.01% to 71.505%; * modification of packagings; * and the addition of trade names   FR CA considers that :   * The product is compatible with all claimed packagings. * Data submitted demonstrated the efficacy of the product FANGA PATE 25 according to uses and doses claimed. * The risk for human health is considered acceptable with appropriate RMMs indicated in the SPC. * The risk for the environnement is considered acceptable with appropriate RMMs indicated in the SPC.   **The major change is therefore accepted and new conditions of uses are given in the SPC.** |

|  |
| --- |
| * **Minor change application for FANGA PATE 25 - 2018** |
| The minor change consists of:   * a reduction of use rates for target organisms rats (*Rattus rattus* and *Rattus norvegicus*) at 100 g per bait station every 5 to 10 meters; * modification of packagings; * the addition of trade names; * and the addition manufacturing sites   FR CA considers that :   * The product is compatible with all claimed packagings. * Data submitted demonstrated the efficacy of the product FANGA PATE 25 according to uses and doses claimed. * The risk for human health and for the environnement has not been reviewed for the minor change assessment.   **The minor change is therefore accepted and new conditions of uses are given in the SPC.** |

# General information about the product application

## Applicant

|  |  |
| --- | --- |
| **Company Name:** | TRIPLAN SA |
| **Address:** | BP258 La Poste Française |
| **City:** | Andorre la Vieille |
| **Postal Code:** | AD500 |
| **Country:** | Principauté d’Andorre |
| **Telephone:** |  |
| **Fax:** |  |
| **E-mail address:** |  |

### Person authorised for communication on behalf of the applicant

|  |  |
| --- | --- |
| **Name:** |  |
| **Function:** | Managing director |
| **Address:** | BP258 La Poste Française |
| **City:** | Andorre la Vieille |
| **Postal Code:** | AD500 |
| **Country:** | Principauté d’Andorre |
| **Telephone:** |  |
| **Fax:** |  |
| **E-mail address:** |  |

## Proposed authorisation holder

|  |  |
| --- | --- |
| **Company Name:** | TRIPLAN SA |
| **Address:** | BP258 La Poste Française |
| **City:** | Andorre la Vieille |
| **Postal Code:** | AD500 |
| **Country:** | Principauté d’Andorre |
| **Telephone:** |  |
| **Fax:** |  |
| **E-mail address:** |  |
| **Letter of appointment for the applicant to represent the authorisation holder provided (yes/no):** | No |

## Information about the product application

|  |  |
| --- | --- |
| **Application received:** | 02/02/2012 |
| **Application reported complete:** | 16/03/2012 |
| **Type of application:** | Product authorisation |
| **Further information:** | Frame formulation: please refer to the Biocidal Product Assessment Report related to frame formulation establishment. |

## Information about the biocidal product

### General information

|  |  |
| --- | --- |
| **Trade name:** | FANGA PATE PRO |
| **Manufacturer’s development code number(s), if appropriate:** | CAUSSADE |
| **Product type:** | 14 - rodenticide |
| **Composition of the product (identity and content of active substance(s) and substances of concern; full composition see confidential annex):** | Active substance’s identity and content: Brodifacoum 0.005% w/w |
| **Formulation type:** | Paste bait |
| **Ready to use product (yes/no):** | Yes |
| **Is the product the very same (identity and content) to another product already authorised under the regime of directive 98/8/EC (yes/no);**  **If yes: authorisation/registration no. and product name:**  **or**  **Has the product the same identity and composition like the product evaluated in connection with the approval for listing of active substance(s) on to Annex I to directive 98/8/EC (yes/no):** | No  No |

### Renewal application 2019:

|  |  |
| --- | --- |
| **Trade name:** | FANGA PATE 25 |
| **Manufacturer’s development code number(s), if appropriate:** | - |
| **Product type:** | 14 - rodenticide |
| **Composition of the product (identity and content of active substance(s) and substances of concern; full composition see confidential annex):** | Active substance’s identity and content: Brodifacoum 0.0025% w/w |
| **Formulation type:** | Paste bait |
| **Ready to use product (yes/no):** | Yes |
| **Is the product the very same (identity and content) to another product already authorised under the regime of directive 98/8/EC (yes/no);**  **If yes: authorisation/registration no. and product name:**  **or**  **Has the product the same identity and composition like the product evaluated in connection with the approval for listing of active substance(s) on to Annex I to directive 98/8/EC (yes/no):** | No  No |

### Information on the intended use(s)

|  |  |
| --- | --- |
| **Overall use pattern (manner and area of use):** | Indoor environment (public and private buildings, farms.) |
| **Target organisms / stages:** | I.1.1 Murids : *Muridae*  I.1.1.1 Brown rat: *Rattus norvegicus*  I.1.1.2 Roof rat, House rat: *Rattus rattus*  I.1.1.3 House mouse: *Mus musculus* |
| **Category of users:** | V.2 Professional |
| **Directions for use including minimum and maximum application rates, application rates per time unit (e.g. number of treatments per day), typical size of application area:** | VI.2 Covered application  VI.2.1 in bait stations  FANGA PATE PRO is intended to be used for control of mice, brown rats and black rats in buildings included farm buildings.  The treatment with FANGA PATE PRO is applied by trained professional users.  The product is ready-to-use (paste) so with no dilution and no other substances added for application.  FANGA PATE PRO is supplied as 10 g paste wrapped individually in a white heat-sealed paper sachet and is manually applied in secured bait stations.  Rats :  180 g grains/secured bait point separated by 5-10 m.  Mice :  30 g grains/secured bait point separated by 1-2 m.  Over a period of 28 days for application, cleaning, refilling and collect of dead rodents.  The control of rats and mice is carried out inside buildings, so the environmental conditions in which rodents are found tend to be similar relating to geographical areas. |
| **Potential for release into the environment (yes/no):** | Yes |
| **Potential for contamination of food/feedingstuff (yes/no)** | No |
| **Proposed Label:** | FANGA PATE PRO is intended to be used for control of mice, brown rats and black rats in buildings included farm buildings.  The treatment with FANGA PATE PRO is applied by trained professional users.  Rats :  180 g grains/secured bait point separated by 5-10 m.  Mice :  30 g grains/secured bait point separated by 1-2 m.  Hazard symbol: None  Indication of danger : None  Risk phrases: None  Safety phrases:  S1/2: Keep locked up and out of reach of children.  S7: Keep container tightly closed.  S13: Keep away from food, drink and animal feeding stuffs.  S20/21: When using do not eat, drink or smoke.  S24: Avoid contact with skin  S35: This material and its container must be disposed of in a safe way  S36/37: Wear suitable protective clothes and gloves.  S46: If swallowed, seek medical advice immediately (show label if possible).   * S49: Keep only in original container |
| **Use Restrictions:** | Use only indoors in secured bait stations out of reach of children and domestic animals. |

* **Renewal application 2019 :**

|  |  |
| --- | --- |
| **Overall use pattern (manner and area of use):** | FANGA PATE 25 is intended to be used for control of :  Mice : Indoor for non-professionals users and indoor, outdoor, open area and waste dumps for professional users  Rats: Indoor and outdoor for non-professionals users and indoor, outdoor, open area and waste dumps for professional users. |
| **Target organisms / stages:** | Murids : *Muridae*  Brown rat: *Rattus norvegicus*  Roof rat, House rat: *Rattus rattus*  House mouse: *Mus musculus* |
| **Category of users:** | Non-professional / general public  Professional (not relevant in France)  Trained professional |
| **Directions for use including minimum and maximum application rates, application rates per time unit (e.g. number of treatments per day), typical size of application area:** | Covered application  In bait stations  FANGA PATE 25 is intended to be used for control of mice, brown rats and black rats indoor, outdoor, open area and waste dumps.  The treatment with FANGA PATE 25 is applied by trained professional users, professional users and non-professional users.  The product is ready-to-use (paste) so with no dilution and no other substances added for application.  FANGA PATE 25 is supplied as paste wrapped individually in a white heat-sealed paper sachet and is manually applied in secured bait stations.  Rats :  100 g grains/secured bait point separated by 5-10 m.  Mice :  30 g grains/secured bait point separated by 1-2 m.  Over a period of 28 days for application, cleaning, refilling and collect of dead rodents.  The control of rats and mice is carried out inside buildings, so the environmental conditions in which rodents are found tend to be similar relating to geographical areas. |
| **Potential for release into the environment (yes/no):** | Yes |
| **Potential for contamination of food/feedingstuff (yes/no)** | No |
| **Proposed Label:** | Control of rats (black rats and brown rats) and mice indoor, outdoor, open area and waste dumps. |
| **Use Restrictions:** | Use only indoors in secured bait stations out of reach of children and domestic animals. |

### Information on active substance

According to the Assessment Report Revised in November 2010, the technical equivalence between the two sources of the Task Force has not been demonstrated. As the Activa’s source is not recognized, only an authorized source must be used.

|  |  |
| --- | --- |
| **Active substance chemical name:** | Brodifacoum |
| **CAS No:** | 56073-10-0 |
| **EC No:** | 259-980-5 |
| **Purity (minimum, g/kg or g/l):** | 950 g/kg |
| **Inclusion directive:** | 2010/10/CE |
| **Date of inclusion:** | 9 February 2010 |
| **Is the active substance equivalent to the active substance listed in Annex I to 98/8/EC (yes/no):** | No |
| **Manufacturer of active substance(s) used in the biocidal product:** | PM TEZZA SRL[[1]](#footnote-2) |
| **Company Name:** | PM TEZZA SRL |
| **Address:** | Via Tre Ponti 22 |
| **City:** | S. Maria di Zevio (VR) |
| **Postal Code:** | 37050 |
| **Country:** | Italy |
| **Telephone:** |  |
| **Fax:** |  |
| **E-mail address:** |  |

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| **COMPARATIVE ASSESSMENT**  Brodifacoum does meet the exclusion criteria laid down in Article 5(1)(c) of Regulation (EU) No 528/2012. Brodifacoum does meet the conditions laid down in Article 10(1)(a) and (e) of Regulation (EU) No 528/2012 if approved, and is therefore considered as a candidate for substitution.  A comparative assessment has been carried out at the European level. According to Article 1 of Commission Implementing Decision (EU) 2017/1532 of 7 September 2017 addressing questions regarding the comparative assessment of anticoagulant rodenticides in accordance with Article 23(5) of Regulation (EU) No 528/2012 of the European Parliament and of the Council. In the absence of anticoagulant rodenticides, the use of rodenticides containing other active substances would lead to an inadequate chemical diversity to minimize the occurrence of resistance in the target harmful organisms.  In summary it can be concluded that the criteria according Article 23(3) a), b) BPR are not fulfilled. Therefore, the authorisation of this product will be renewed for 5 years. |

### Information on the substance(s) of concern

There is no substance of concern.

### Assessment of endocrine disruption (ED) properties of co-formulants in biocidal products

* **Renewal application - 2019**

According to our assessment, none of the co-formulants contained in the product FANGA PATE 25 is identified as endocrine disruptors. However, several co-formulants show indications of endocrine activity (refer to confidential annex).

Based on available information, it is not possible to conclude whether these co-formulants should be considered to have ED properties or not. This should be further assessed in the frame of REACH Regulation.

One coformulant is currently being evaluated in the frame of REACH for its potential ED properties. Hence, it is not possible to conclude whether this co-formulant should be considered to have ED properties or not before the end of the assessment.

In case these co-formulants are finally identified as ED, the biocidal product will be considered as ED and authorisation will have to be revised accordingly.

## Documentation

### Data submitted in relation to product application

**Identity, physico-chemical and analytical method data**

Physico-chemical properties studies and analytical methods on the biocidal product FANGA PATE PRO were provided by TRIPLAN.

|  |
| --- |
| * **Major change application FANGE PATE 25 – 2018** |
| Physico-chemical properties studies and analytical methods with the new composition FANGA PATE 25 were provided by TRIPLAN. |

|  |
| --- |
| * **Minor change application FANGE PATE 25 – 2018** |
| No additional data was provided in the frame of the minor change of the product authorisation. The minor change consists on an addition of packagings. See dedicated part (part 2.2.4) for details. |

|  |
| --- |
| * **Renewal application FANGA PATE 25 – 2019 :** |
| A new long term storage stability study has been submitted for the renewal of the biocidal product authorisation. |

**Efficacy data**

The following efficacy studies were submitted:

* A free-choice laboratory test was carried out with house mice (*Mus musculus*) and brown rats (*Rattus* *norvegicus*), with exposure to FANGA PATE PRO (0.005 % w/w brodifacoum) for 20 days. The age of the product tested is not known.
* A free-choice laboratory test was carried out with rats (*Rattus norvegicus*), with exposure to a one year aged formulation of FANGA PATE PRO (0.005 % w/w brodifacoum) for 4 days.
* A free-choice laboratory test was carried out with house mice (*Mus musculus*), with exposure to a one year aged formulation of FANGA PATE PRO (0.005 % w/w brodifacoum) for 4 days.
* A field test was carried out with rats (*Rattus norvegicus*), with exposure to a one year aged formulation of FANGA PATE PRO (0.005 % w/w brodifacoum).
* A field test was carried out with house mice (*Mus musculus*), with exposure to a one year aged formulation of FANGA PATE PRO (0.005 % w/w brodifacoum).

|  |
| --- |
| * **Major change application FANGA PATE PRO – 2016** |
| The following efficacy studies were submitted:   * A field test was carried out with rats (*Rattus rattus)*, with exposure to a 1 month aged formulation of FANGA B+. * A field test was carried out with rats (*Rattus rattus*), with exposure to a 29 months aged formulation of FANGA PATE PRO. * A field test was carried out with rats (*Rattus norvegicus*), with exposure to a 29 months aged formulation of FANGA PATE PRO. * A field test was carried out with house mice (*Mus musculus*), with exposure to a 39 months aged formulation of FANGA PATE PRO. |

|  |
| --- |
| * **Major change application FANGE PATE 25 – 2018** |
| To support the efficacy of the new formulation of the product FANGA PATE 25, the applicant has submitted studies with the product FANGA B+.  The main difference between both products is the concentration of active substance: FANGA B+ contains 0.001 % w/w of brodifacoum and FANGA PATE 25 contains 0.0025% w/w of brodifacoum, other components are the same to nearly the same concentrations. Therefore efficacy studies conducted with FANGA B+ are acceptable to demonstrate the efficacy of FANGA PATE 25.  The following efficacy studies were submitted:   * A free-choice laboratory test was carried out with mice (*Mus musculus*), with exposure to a 1 years aged FANGA B+ (0.001 % brodifacoum) for 4 days. * A field test was carried out with house mice (*Mus musculus*), with exposure to a fresh formulation of FANGA B+ (0.001 % brodifacoum). * A free-choice laboratory test was carried out with brown rats (*Rattus norvegicus*), with exposure to a 1 year aged of FANGA B+ (0.001 % brodifacoum) for 4 days. * A field test was carried out with brown rats (*Rattus norvegicus*), with exposure to a fresh formulation of FANGA B+ (0.001 % brodifacoum). * A field test was carried out with black rats (*Rattus rattus*), with exposure to a 3 years aged of FANGA B+ (0.001 % brodifacoum). |

|  |
| --- |
| * **Minor change application FANGE PATE 25 – 2018** |
| The following efficacy studies were submitted:   * A field test was carried out with brown rats (*Rattus norvegicus*), with exposure to 4 years and 1 month aged formulation of FANGA B+ (0.001 % brodifacoum). * A field test was carried out with black rats (*Rattus rattus*), with exposure to 4 years and 1 month aged formulation of FANGA B+ (0.001 % brodifacoum). |

**Toxicology data Residue and Ecotoxicology sections:**

Please see the attached reference list in Annex 1.

|  |
| --- |
| * **Minor change application FANGE PATE 25 – 2018** |
| The applicant submitted new toxicological data on active substance and studies for the product. |

**Residue data**

No new study has been submitted for the biocidal product authorisation.

**Ecotoxicology data**

No new study has been submitted for the biocidal product authorisation.

### Access to documentation

As stated in the letter of access granted by Activa to Triplan:

*Activa S.r.l, (via Feltre 32, Milano-ltaly), as Notifier and having rights on all the data included in the Dossier for Brodifacoum (CAS No: 56073-10-0) presented by The Activa/Pelgar Brodifacoum and Difenacoum Task Force (composed by: Activa/Tezza S.r.l and Pelgar International Ltd) for Annex I listing to RMS ltaly* ***authorises*** *the France competent authorities to use these data for authorisation purpose TRIPLAN (BP 258 Poste Francaise - AD500 Andorre la Vieille - PRINCIPAT D'ANDORRA) for the product* ***FANGA PATE PRO*** *(PT14).*

Please refer to the LoA for the complete list of studies for which access has been granted.

|  |
| --- |
| * **Major change application FANGE PATE 25 – 2018** |
| Additional LOA has been submitted for FANGA PATE 25. |

# Summary of the product assessment

The product is to be used in tamper-resistant bait boxes or covered bait stations.

”Tamper-resistant bait boxes” are meant to be tamper-resistant devices, that prevent the access to the baits for children and non-target animals, and that protect the baits from bad weather.

”Covered bait stations” are meant to be devices with the same level of security for the human beings and the environment than the security provided by tamper-resistant bait boxes, fastened to prevent any removal, made in order to avoid direct contact of the bait with the environment. This device must be designed to keep baits out of reach of the general public and non-target animals, and to protect the bait from bad weather

It is considered that professional users only (on the contrary to the general public) are able to design such covered bait stations.

## Identity related issues

The source of the active substance used in the biocidal product FANGA PATE PRO is not the same as the source used for annex I inclusion. The technical equivalence is in progress and evaluated by Italy. Only a recognized source of active substance can be used in the product FANGA PATE PRO[[2]](#footnote-3). Refer to the confidential annex for more details.

|  |
| --- |
| * **Major change application FANGA PATE PRO – 2016** |
| The source of the active substance used in the biocidal product FANGA PATE PRO is not the same as the source used for annex I inclusion. The technical equivalence has been evaluated and accepted by IT. |

## Classification, labelling and packaging

### Harmonised classification of the active substance

|  |  |  |
| --- | --- | --- |
| **Classification - Directive 67/548/EEC** | | |
| Class of danger | T+ | |
| N | |
| R phrases | R27/28 | Very toxic in contact with skin and if swallowed. |
| R48/24/25 | Toxic: danger of serious damage to health by prolonged exposure in contact with skin and if swallowed. |
| R50/53 | Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |

|  |  |
| --- | --- |
| Specific limit concentrations for the environment: | |
| C ≥ 2.5 % | N; R50/53 |
| 1 % ≤ C <2.5 % | N; R51/53 |
| 0.5 % ≤ C< 1 % | N; R51/53 |
| 0.25 % ≤ C< 0.5 % | N; R51/53 |
| 0.025 % ≤ C< 0.25 % | R52/53 |

The classification for the environment, under Directive 67/548/EEC, was agreed in April 2006 by the Technical Committee on Classification and Labelling (TC C&L) of Dangerous Substances.

|  |  |  |
| --- | --- | --- |
| **Classification - Regulation (EC) 1272/2008** | | |
| Hazard statement | Acute Tox. 1 | |
| Acute Tox. 2 | |
| STOT RE 1 | |
| Aquatic Acute 1 | |
| Aquatic Chronic 1 | |
| Precautionary statements | H310 | Fatal in contact with skin. |
| H300 | Fatal if swallowed. |
| H372 | Causes damage to organs through prolonged or repeated exposure. |
| H400 | Very toxic to aquatic life. |
| H410 | Very toxic to aquatic life with long lasting effects. |

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| |  |  |  | | --- | --- | --- | | **Classification - Regulation (EC) 1272/2008** | | | | Hazard category | Acute Tox. 1 | | | STOT RE 1 | | | Repr.1A | | | Aquatic Acute 1 | | | Aquatic Chronic 1 | | | Hazard statements | H310 | Fatal in contact with skin. | | H300 | Fatal if swallowed. | | H330 | Fatal if inhaled | | H372 | Causes damage to organs (blood) through prolonged or repeated exposure. | | H360D | May damage the unborn child | | H400 | Very toxic to aquatic life. M-factor = 10 | | H410 | Very toxic to aquatic life with long lasting effects. M-factor = 10 | | Specific Concentration Limits | Repr. 1A; H360D: C ≥ 0,003 %  STOT RE 1; H372: C ≥ 0,02 %  STOT RE 2; H373: 0,002 % ≤ C < 0,02 % | | |

### Classification of the biocidal product

|  |  |
| --- | --- |
| **Classification - Directive 67/548/EEC** | |
| Class of danger | None |
| R phrases | None |
| S phrases | None |

|  |  |
| --- | --- |
| **Classification - Regulation (EC) 1272/2008** | |
| Hazard statement | None |
| Precautionary statements | None |

|  |
| --- |
| * **Major change for FANGA PATE 25 – 2018** |
| |  |  | | --- | --- | | **Classification - Regulation (EC) 1272/2008** | | | Hazard category | STOT RE 2 | | Hazard statements | H373: May cause damage to organs (blood) through prolonged or repeated exposure | | Precautionnary statements | P314: Get medical advice/attention if you feel unwell  P501: Dispose of contents/container to … [… in accordance with local/regional/national/international regulation (to be specified)]. | |

### Labelling of the biocidal product

|  |  |
| --- | --- |
| **Labelling - Directive 67/548/EEC** | |
| Symbols: | None |
| Indications of danger: | None |
| Risk phrases: | None |
| Safety phrases: | None |

|  |  |
| --- | --- |
| **Labelling - Regulation (EC) 1272/2008** | |
| Pictograms: | None |
| Signal words: | None |
| Hazard statements: | None |

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| The labelling of the product according to the CLP is the following   |  |  | | --- | --- | | **Labelling - Regulation (EC) 1272/2008** | | | Pictograms: |  | | Signal words: | Warning | | Hazard statements: | H373: May cause damage to organs (blood) through prolonged or repeated exposure | | Precautionnary statements | P260: Do not breathe dust/fumes/gas/mist/vapours/spray  P314: Get medical advice/attention if you feel unwell  P501: Dispose of contents/container to … [… in accordance with local/regional/national/international regulation (to be specified)]. | |

### Packaging of the biocidal product

FANGA PATE PRO is supplied in paper sachet (10 g for rats and mice).

Sachets are packed in:

* polypropylene bucket (5, 10, 15, 18 and 20kg);
* plastic bag (laminated film in PET/ PVDC (12µ) and transparent polyethylene (50µ)) with a capacity of 100g to 1kg. Several bags can be packed in a cardboard box with a capacity of 20kg.

|  |
| --- |
| * **Major change application for FANGA PATE PRO – 2016** |
| For the major change, new packagings and new users below were claimed:  **For professionals:**  FANGA PATE PRO is supplied in paper sachet (10 and 20g).  Sachets are packed in:  - high density polyethylene or polypropylene bucket (5, 10, 15, 18, 20kg)  - polyethylene bags and packed in cardboard box (5, 10, 12, 15, 20, 50kg)  In France, the minimum packaging size is 5 kg  **For non-professionals:**  FANGA PATE PRO is supplied in paper sachet (10 and 20 g).  Sachets are packed in:   * high density polyethylene or polypropylene bucket (0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.2, 1.3, 1.4, 1.5kg) * polyethylene bags and packed in carton box (0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.2, 1.3, 1.4, 1.5kg) * metal box without lacquer (0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.2, 1.3, 1.4, 1.5kg) * bait box (Polyethylene terephtalate/Polypropylene/Polyethylene/Polyvinyl chloride) * high density polyethylene flacon (0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1, 1.2, 1.3, 1.4, 1.5kg).   In France, the maximum packaging size for non professional user is 1.5 kg |

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| Packagings claimed and accepted are the following:  **For professionals:**  FANGA PATE 25 is supplied in paper sachet (5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150,160, 170, 180 and 200 g).  Sachets are packed in:  - HDPE or PP bucket (5-10-15-18-20 kg)  - PE bags and packed in cardboard box (5-10-12-15-18-20-25-30-50 kg)  - Cardboard box - 5-10-12-15-18-20-25-30-50 kg  - PE or PE sachet  in France, the minimum packaging size is 5 kg  **For non-professionals:**  Rats and mice :  FANGA PATE 25 is supplied in paper sachet (5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100g).  Sachets from 100 to 150 g have been claimed. Given the applied dose (180g max per bait station) and retrictions for non professional users, sachets over 100 g are not relevant.  Sachets are packed in:  - HDPE or PP or PE bucket (max 150g)  - PE bags and packed in carton box (max 150g)  - Metal box without lacquer (max 150g)  - Bait box (PET/PP/PE/PVC)  - HDPE flacon (max 150g).  - PE or PE sachet of 10, 15, 20, 25, 30, 40, 50, 75 and 100g (max 150g).  Maximum packaging size: 150g |

|  |
| --- |
| * **Minor change application for FANGA PATE 25 - 2018** |
| For the minor change, new packagings have been claimed by the applicant (*itallic*).  **For Professionals users:**  The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100 g) and PP/PE sachets (10-15-20-25-50-75-100-200-300-400-500-600-700-800-900-1000 g).  Heat-sealed paper sachets are packed in:  - *PP/PE* *Buckets-Barrel* (5-10-15-18-20-25 kg)  - *Carton box with PP/PE protection inside* (5-10-12-15-20-50 kg)  - *Metal Box-Barrel without lacquer* (5-10-12-15-18-20-25-30-40-50 kg)  *PP/PE or PE/PP sachets are wrapped or not inside cardboard box* (5-10-12-15-18-20-25-30-50 kg)  in France, the minimum packaging size is 5 kg  **For non-professionals:**  The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100 g).  Heat-sealed paper sachets are packed in:  - *PP/PE bucket* (max 150 g)  - Metal box without lacquer (max 150 g)  - *PP/PE flacon* (max 150 g)  - *PE/PP or PP/PE sachets* (max 150 g)  - Prefilled tamper resistant PET/PP/PE/PVC bait station. |

|  |
| --- |
| * **Renewal application FANGA PATE 25 – 2019** |
| Packagings of the product renewal have not been changed and contain all packagings described above. |

## Physico/chemical properties and analytical methods

### Active ingredient

#### Identity, origin of active ingredient

The source of the active substance used in the biocidal product FANGA PATE PRO is not the source used for annex I inclusion. The technical equivalence is in progress and evaluated by Italy. Only a recognized source of active substance can be used in the product FANGA PATE PRO. Refer to the confidential annex for more details.

|  |
| --- |
| * **Major change application for FANGA PATE PRO – 2016** |
| The source of the active substance used in the biocidal product FANGA PATE PRO is not the same as the source used for annex I inclusion. The technical equivalence has been evaluated and accepted by IT.  A letter of access to brodifacoum data from Activa has been provided. |

#### Physico-chemical properties

Physical and chemical properties of the active substance have already been evaluated at EU level and are presented in the CAR of the active substance brodifacoum (2010). The applicant TRIPLAN has a letter of access to these data.

**Source CAR 2010 (Document I):**

Brodifacoum is an off-white powder at 20°C and atmospheric pressure, with a relative density of 1.53. It was observed to darken and decompose at 235.8°C, whereas no decomposition or transformation occurred below 150°C.

Brodifacoum is non-volatile, with a Henry’s Law Constant value of 2.35E-18 Pa.m3.mol-1. It is essentially insoluble in water at pH 5, but its solubility proved to increase with pH, due to the variation of the ionisation degree of the 4-hydroxycoumarin group in pH range under investigation (5-9). Brodifacoum also turned out to be soluble in organic solvents; results showed that solubility did not vary with temperature, except for dichloromethane.

Brodifacoum dissociation constant was estimated to be 4.50. Log Pow was found to be 4.92 at pH 7 and 20°C. As expected, Log Pow decreased with higher temperature and pH.

Brodifacoum is not highly flammable. Besides, it does not show explosive or oxidising properties. Reaction with container materials (mild steel) has not been observed, either. All results considered, it can be concluded that Brodifacoum does not exhibit hazardous physical-chemical properties.

#### Analytical method for determination of active ingredient and impurities in the technical active ingredient

Analytical method for the determination of pure active substance brodifacoum in the technical active substance as manufactured has already been performed and validated at EU level in the CAR of brodifacoum (2010). The applicant TRIPLAN has a letter of access to these data.

**Summary: (source AR November 2010)**

|  |  |
| --- | --- |
|  | **Principle of method** |
| Technical active substance as manufactured: | Brodifacoum is analysed in the technical material by reversed-phased HPLC/UV (254nm)  Purity : 96.2-99.4% w/w (mean: 98.1 % w/w) |

#### Analytical method for determining relevant components and/or residues in different matrices

Analytical methods for the determination of residues of the active susbtance brodifacoum in the different matrices (plants, soil drinking, ground, surface water, human and animal body fluids and tissues) have already been performed and validated at EU level in the CAR of brodifacoum (2010). No method in air is required since the active substance is non volatile.

Analytical methods are presented in Annex 3 of this document.

The applicant TRIPLAN has a letter of access to these data.

### Biocidal product

#### Identity, composition of the biocidal product, packaging

The biocidal product is not the same as the one assessed for the inclusion of the active substance in annex I of directive 98/8/EC.

Trade name: *Fanga PATE Pro*

Type of product: PT14, bait ready to use

Type of formulation: paste bait

The composition of the product is confidential and is presented in a confidential annex. There is no substance of concern.

#### Physico-chemical properties

The tested product is FANGA PATE PRO. Brodifacoum content in tested product is 0.0055% w/w (variation 10%). It is in the range of the FAO tolerance (15%).

The product does not contain more than 10 % of hydrocarbon compounds.

Table 1: **Physico-chemical properties of the biocidal product (FANGA PATE PRO, PAR – 2014 )**

| Subsection (Annex Point IIB. 3/TNsG) | **Method** | **Purity/ Specification** | **Results[[3]](#footnote-4)** | **Remarks/ Justification** | **GLP (Y/N)** | **Reliability** | **Reference** | **Evaluation FR** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3.1 Appearance (IIB3.1/Pt. I-B3.1) |  | FANGA PATE PRO (brodifacoum 0.0055%)  Batch: 308/11/01 |  |  | Y | 1 | 11-920010-017[[4]](#footnote-5) | Acceptable |
| 3.1.1 Physical state and nature |  | Paste  Bait ready for use (BB) |  |
| 3.1.2 Colour | Visual inspection at room temperature | Blue paste |  |
| 3.1.3 Odour | Not determinated | | | An odour should only be recorded it is very apparent |
| 3.2 Explosive properties (IIB3.2/Pt. I-B3.2) | Determination of exothermic reactions by DSC (internal method) | FANGA PATE PRO (brodifacoum 0.0055%)  Batch: 308/11/01 | Exothermic peaks were observed but were always below 500J/g. No test on explosive properties with EC A14 is required. |  | Y | 1 | 11-920010-016[[5]](#footnote-6) | Acceptable. Accordin g to the composition and the DSC results, the product does not contain explosive compounds. |
| 3.3 Oxidising properties (IIB3.3/Pt. I-B3.3) |  |  | Based on most recent approach of structural formulas, the product does not contain oxidizing compound, or they are in low content (<1%).  Accordingly, the biocidal product is not expected to present a significant hazard, and testing is considered as unnecessary. |  |  |  | 11-920010-016 | Acceptable. Accordin g to the composition and the type of formulation, the product is not expected to have explosive properties. |
| **3.4 Flash-point and other indications of flammability or spontaneous ignition (IIB3.4/Pt. I-B3.4)** | EC A10 | FANGA PATE PRO (brodifacoum 0.0055%)  Batch: 308/11/01 | Preliminary test: the test was performed twice.  Conditions of the test:  Humidity: About 39%  Room temperature : About 19.5 °C  Atmospheric pressure: 97.9 kPa  Assay 1: A consumption of the paste was observed at the contact of the flame. Neither propagation nor ignition was observed  Assay 2: The same observations as for the assay 1 were recorded.  Main test:  Taking in account the results obtained during the preliminary test, no main test was performed.  The test item was not considered as highly flammable under the experimental conditions of the test**.** |  | Y |  | 11-920010-016 | Acceptable. The product is not auto-flammable and not highly flammable. |
| Self ignition | **EC** A16 |  | No self ignition temperature of the test item was observed **up to 400°C** (corrected value). |  |  |  |  | The product is not auto-flammable |
| 3.5Acidity/Alkalinity (IIB3.5/Pt. I-B3.5) | CIPAC MT 75.3 | FANGA PATE PRO (brodifacoum 0.0055%)  Batch: 308/11/01 | The pH mean value of the test item at 1% m/v in standard water D is :  5.22 at 19.4 °C after 1 min.  5.43 at 19.5°C after 2 min.  5.83 at 19.7°C after 10 min.  The pH of the test item being higher than 4 and lower than 10, CIPAC MT 191 the test was not performed. |  | Y | 1 | 11-920010-017 | Acceptable |
| 3.6 Relative density (IIB3.6/Pt. I-B3.6) | EC A.3 | FANGA PATE PRO (brodifacoum 0.0055%)  Batch: 308/11/01 | Material: stereopycnometer  D204= 1.322 +/- 0.001 |  | Y |  | 11-920010-016 | Acceptable |
| 3.7 Storage stability - stability and shelf life (IIB3.7/Pt. I-B3.7) | 14 days at 54°C ± 2 °C  CIPAC MT 46.3 | FANGA PATE PRO (brodifacoum 0.0055%)  Batch: 308/11/01 | **Test item during the accelerated storage:** 10 g paper sachets in plastic buckets, carboard box and plastic bag (commercial packaging)  **Aspect:**  Before the accelerated storage the product looks like a blue paste.  After the procedure of storage, the test item looks like a blue paste. |  | Y | 1 | 11-920010-017 | Acceptable. The product is stable after storage at 54°C for 14 days in 10g paper sachets. |
| Reactivity towards container material | **Packaging of the test item**  Before the accelerated storage: White opaque plastic bucket containing bags of blue paste.  Weight : 947.5 g  After the accelerated storage: White opaque plastic bucket containing bags of blue paste.  Weight : 943.4g  DW = -0.4%  The aspect of the test item was considered to be stable after an accelerated storage procedure for 14 days at 54 ± 2 °C, no significant change ofweight was observed.  The packaging material was considered to be stable after an accelerated storage procedure for 14 days at 54 ± 2 °C. |  |  |  |  |
| **Quantitative analysis of brodifacoum (analytical method validated in report 11-920010019) :**  The content of brodifacoum before accelerated storage procedure was:  Assay 1 (DEF11-0670A): 0.0054%.  Assay 2 (DEF11-0671A): 0.0055%.  The content of brodifacoum after accelerated storage procedure was:  Assay 1 (DEF11-0710B): 0.0053%.  Assay 2 (DEF11-0711A): 0.0052%  No significant change was observed (-3.6% to -5.45% deviation from T=0 value) after the accelerated storage procedure for 14 days at 54°C ±2°C.  The test item is considered to be stable. |  |  |  |  | Acceptable.  Variation of bromadifacoum: -3.6% to -5.45%  Variation is above 5% (maximal limit); Variation can be due to analytical deviations.  As results are acceptable, a two years shelf life can be granted. |
|  | CIPAC MT 75.3 | **Determination of pH values:**  The pH mean value of the test item at 1% m/v in standard water D is :  Before the accelerated storage procedure:  5.22 at 19.4 °C after 1 min.  5.43 at 19.5°C after 2 min.  5.83 at 19.7°C after 10 min.  After the accelerated storage procedure:  5.31 at 20.0 °C after 1 min.  5.35 at 20.1°C after 2 min. |  |  |  |  | Acceptable |
| Effects of light |  |  | Not required since the product will be stored protected from light. |  |  |  |  | Acceptable |
| Shelf life |  |  |  |  |  |  |  | No study provided. End of the test: March 2012. |
| Effect of low temperature |  |  |  |  |  |  |  | No study provided. |
| 3.8 Technical characteristics  (IIB3.8/Pt. I-B3.8) | | | | | | | | |
| Wettability/ Suspensibility |  |  |  | Only solid preparations |  |  |  | Not applicable |
| Wet sieve analysis |  |  |  | For WPs, SCs, granules, tablets |  |  |  | Not applicable |
| Emulsifiability |  |  |  | Only forECs and ready for use emulsions |  |  |  | Not applicable |
| Disintegration time |  |  |  | Only for tablets |  |  |  | Not applicable |
| Friability of blocks |  |  |  |  |  |  |  | Not applicable |
| Persistence of foaming |  |  |  |  |  |  |  | Not applicable |
| Flowability/Pourability |  |  |  | Flowability only for granular preparations, pourability only for suspensions |  |  |  | Not applicable |
| Dustability |  |  |  | Only for dustable powders |  |  |  | Not applicable |
| 3.9Compatibility with other products (IIB3.9/Pt. I-B3.9) |  |  |  |  |  |  |  | Not applicable |
| 3.10 Surface tension (Pt. I-B3.10) |  |  |  |  |  |  |  | Not applicable |
| 3.11 Viscosity (Pt. I-B3.10) |  |  |  |  |  |  |  | Not applicable |
| **3.12 Particle size distribution (Pt. I-B3.11)** |  |  |  | Only for powders and granules |  |  |  | Not applicable |

**Conclusion**

The product FANGA PATE PRO is a ready to use paste bait for mice and rats. The product is not highly flammable and not auto-flammable. It has no explosive or oxidizing properties. The pH of the product at 1%w/v in water after 10 min at 19.7°C is 5.83. The relavite density of the product is 1.322.

After storage at 54°C for 14 days in 10g paper sachets, the content of active substance decreased from 3.6 to 5.4%. The applicant has demonstrated that the product is stable after accelerated storage.

No study has been provided for the long term stability. As the accelerated storage is acceptable, a shelf life of 2 years can be granted. Study are required post registration to confirm the shelf life of the product.

**Data requirement:**

A long term storage stability study is required post-registration.

* **Major change application for FANGA PATE PRO – 2016**

The shelf life study 2 years at ambient temperature was required in post authorization. The study was received and assessed in 2016:

Table 2: Physico-chemical properties of the active substance.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subsection (Annex Point IIB. 3/TNsG)** | **Method** | **Purity/ Specification** | **Results** | **Remarks/ Justification** | **GLP (Y/N)** | **Reliability** | **Reference** | **Evaluation FR** |
| **3.7 Storage stability - stability and shelf life (IIB3.7/Pt. I-B3.7)** | 2 years at 20°C (Technical Monograph N°17) | FANGA PATE PRO (brodifacoum 0.0055%)  Batch: 308/11/01 | **Test item during the shelf life study:** white opaque polypropylene bucket containning paper bags with the product (blue paste) inside  **Aspect:**  Before the storage the product looks like a blue paste.  After the procedure of storage, the test item looks like a blue paste. |  | Y | 1 | 11-920010-018 | Acceptable. Aspect of the test item and packaging are stable after long term storage in polypropylene bucked. The product is compatible with all claimed packaging. However, for metal packaging, another storage stability study has been provided. |
| Reactivity towards container material | **Packaging of the test item**  Before storage: White opaque polypropylene bucket containing paper bags with the test item  After 24 months: White opaque plastic bucket containing bags with the test item  Weight change = -0.3%  The aspect of the test item was considered to be stable after the storage procedure for 2 years at ambient temperature, no significant change ofweight was observed.  The packaging material was considered to be stable after the storage procedure. |  |  |  | 11-920010-018 |
| **Quantitative analysis of brodifacoum (analytical method validated in report 11-920010019) :**  The content of brodifacoum before the storage procedure was 0.0055%  The content of brodifacoum after the storage procedure was 0.0053%  No significant change was observed (-3.6% to -3.6% deviation from T=0 value) after the long term storage procedure.  The test item is considered to be stable. |  |  |  |  | Acceptable. The product is stable after storage in plastic bucket packaging. |
|  | CIPAC MT 75.3 | **Determination of pH values:**  The pH mean value of the test item at 1% m/v in standard water D is :  Before the accelerated storage procedure:  5.22 at 19.4 °C after 1 min.  5.43 at 19.5°C after 2 min.  5.83 at 19.7°C after 10 min.  After 24 months of storage procedure:  5.99 at 20.0 °C after 1 min.  5.98 at 20.1°C after 2 min. |  |  |  | 11-920010-018 | Acceptable |
| **3.7 Storage stability - stability and shelf life (IIB3.7/Pt. I-B3.7)** | CIPAC MT 46.3 | FANGA B+ 0.0099 g/kg  Brodifacoum  15-024 | **Aspect**  Before and after accelerated storage:  blue paste, thermofused plastic bags in an aluminium can. No change of weight.  **Active substance content**  Before accelerated storage: 0.00099  After accelerated storage: 0.00096 (-3%) | The study was performed on FANGA B+. Its composition is similar the very similar to FANGA PATE PRO which contains less brodifacoum (0.001%). Therefore, the sudy can be used for FANGA PATE PRO. | Y | 1 | Report 15-920010-005 (2015) | The study has been performed with FANGA B+. However, an extrapolation to FANGA PATE PRO is acceptable.  Test has not been performed in loose in can since pasta is before packed in plastic bag. Nevertheless, regarding the composition, no corrosion effect is suspected. Therefore, it can be assumed that the product is compatible with can. |

**Conclusion for the post-authorisation and major change data (FANGA PATE PRO, PAR-2016)**

The product FANGA PATE PRO is considered stable after storage 2 years at ambient temperature.

* **Major change application – FANGA PATE 25 – 2018**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Property** | **Guideline and Method** | **Purity of the test substance (% (w/w)** | **Results** | **Results** | **Reference** |
| Storage stability test – **14 days at 54°C** | CIPAC 46.3 | FANGA PATE 25  (0.0025% w/w of brodifacoum)  Batch n° BDPA25V1 | Determination of physico-chemical properties and storage stability test packed in PP bucket:   |  |  |  | | --- | --- | --- | |  | Initial | After 14 days at 54°C | | Appearance | Paper bagged homogeneous blue paste | Paper bagged homogeneous blue paste | | Appearance of packaging | PP bucket | PP bucket | | Variation of weight (%) | - | -0.8% | | Content of AS | 0.00246% | 0.00229% | | Variation of AS (%) | - | -6.9% |   Quantification of AS has been done by HPLC UV detection with the method evaluated in the PAR.  Determination of physico-chemical properties and storage stability test packed in Metallic can:   |  |  |  | | --- | --- | --- | |  | Initial | After 14 days at 54°C | | Appearance | Paper bagged homogeneous blue paste | Paper bagged homogeneous blue paste | | Appearance of packaging | Metallic can | Metallic can | | Variation of weight (%) | - | 0.0% | | Content of AS | 0.00246% | 0.00225% | | Variation of AS (%) | - | -8.5% |   Quantification of AS has been done by HPLC UV detection with the method evaluated in the PAR.  Determination of physico-chemical properties and storage stability test packed in Cardboard box:   |  |  |  | | --- | --- | --- | |  | Initial | After 14 days at 54°C | | Appearance | Paper bagged homogeneous blue paste | Paper bagged homogeneous blue paste | | Appearance of packaging | Cardboard box | Cardboard box | | Variation of weight (%) | - | -3.5% | | Content of AS | 0.00246% | 0.00237% | | Variation of AS (%) | - | -3.7% |   Quantification of AS has been done by HPLC UV detection with the method evaluated in the PAR. | Conclusion: The storage stability test during 14 days at 54°C allow to consider that the product is stable with PP bucket, Metallic can and with Cardboard box packaging. | DEMANGEL, B. (2016), Study n°  16-920010-001 |
| Acidity / alkalinity | CIPAC 75.3 | FANGA PATE 25  (0.0025% w/w of brodifacoum)  Batch n° BMA25V1 | *Before accelerated storage (14 days at 54°C):*  1% w/v in standard water D  6.63 at 21.7°C after 1 min.  6.61 at 20.8°C after 2 min.  *After accelerated storage (14 days at 54°C):*  1% w/v in standard water D  6.68 at 21.7°C after 1 min.  6.65 at 21.8°C after 2 min.  The measured pH value is higher than 4 and lower than 10, therefore no further testing is required. |  | DEMANGEL, B. (2016), Study n°  16-920010-001 |

|  |
| --- |
| **General conclusion on the physical, chemical and technical properties of the product** |
| FANGA PATE 25 is a ready to use paste bait formulation. All studies have been performed in accordance with the current requirements. It is not explosive and has no oxidising properties. The product is not flammable.  The appearance of the product is paper bagged homogeneous blue paste and with no specific odour. The biocidal product is stable 14 days at 54°C in PP bucket, Metallic can and Cardboard box. Considering the product is a solid and it is compatible with PP bucket, Metallic can and Cardboard box, compatibility with other claimed packagings is considered acceptable. The accelerated storage of the product indicates that the biocidal product is expected to be stable 2 years at ambient temperature. A long term storage stability study is needed to confirm the stability of the product in post-authorization.eCA recommends to store away from light due to the sensitivity of the active substance to light.  Its technical characteristics are acceptable for a ready to use paste bait formulation. |

* **Renewal of application FANGA PATE 25 – 2019 :**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subsection (Annex Point IIB. 3/TNsG)** | **Method** | **Purity/ Specification** | **Results** | **Remarks/ Justification** | **GLP (Y/N)** | **Reliability** | **Reference** | **Evaluation FR** |
| Shelf life |  |  |  |  |  |  |  | A new study was provided and is described below |
| Effect of low temperature |  |  |  |  |  |  |  | Product should be protect from frost |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Property** | **Guideline and Method** | **Purity of the test substance (% (w/w)** | **Results** | **Results** | **Reference** |
| Storage stability - stability and shelf life | CIPAC MT 46.3 | FANGA PATE 25  (0.0025% w/w of brodifacoum)  Batch n° BMA25V1 | |  |  |  | | --- | --- | --- | |  | Initial | After 30 months at 20°C in cardboard box | | Appearance | homogeneous blue paste | | | Appearance of packaging | No degradation, deformation or loss of weight after storage | | | Content of AS | 0.00246 | 0.00228 | | Variation of AS |  | -7.3% |  |  |  |  | | --- | --- | --- | |  | Initial | After 30 months at 20°C in PP | | Appearance | homogeneous blue paste | | | Appearance of packaging | No degradation, deformation or loss of weight after storage | | | Content of AS (%w/w) | 0.00246 | 0.0023 | | Variation of AS |  | -6.5% | | pH (1% dilution) | 6.6 | After 36 months: 6.6 |  |  |  |  | | --- | --- | --- | |  | Initial | After 30 months at 20°C in metallic can | | Appearance | homogeneous blue paste | | | Appearance of packaging | No degradation, deformation or loss of weight after storage | | | Content of AS | 0.00246 | 0.00213 | | Variation of AS |  | -13;4% | | DEMANGEL B., 2019, report No 16-920010-002 | The product is stable after 30 months in cardboard box and PP.  In metallic packaging, there is a decrease >10% after 30months. Nevertheless, efficacy at 10ppm of active substance is etablished and a shelf life of 30mnths is accepted.  The study presents results after 36 months storage in these three packagings but all of them are not acceptable (>15% of loss of weight of active substance). **Therefore, the shelf life is set as 30 months.** |

|  |
| --- |
| **General conclusion on the physical, chemical and technical properties of the product** |
| A long term storage study was provided and is described in the table above.  The study shows acceptable results after 30 months in PP, metal can and carboard box.  FANGA PATE 25 is a ready to use paste bait formulation. All studies have been performed in accordance with the current requirements. It is not explosive and has no oxidising properties. The product is not flammable.  The appearance of the product is paper bagged homogeneous blue paste and with no specific odour. The biocidal product is stable 14 days at 54°C in PP bucket, Metallic can and Cardboard box. Considering the product is a solid and it is compatible with PP bucket, Metallic can and Cardboard box, compatibility with other claimed packagings is considered acceptable. The storage stability study of the product indicates that the biocidal product is stable 30 months at ambient temperature.  eCA recommends to store away from light due to the sensitivity of the active substance to light.  Its technical characteristics are acceptable for a ready to use paste bait formulation. |

### Analytical methods for detection and identification

#### Analytical method for determining the active substance and relevant component in the biocidal product

* FANGA PATE PRO

Analytical method for the determination of brodifacoum in the product has been provided

Principle of the method: brodifacoum is analyzed after extraction from the product with methanol, filtered and quantified by reverse phase HPLC-UV.

Chromatographic conditions:

Colum: Zorbax SB Phenyl, length: 25cm, internal diameter: 3.0mm, granulometry: 5.0µm, Agilent.

Detector: UV, 265nm.

Mobile phase: Eluent A acetonitrile, Eluent B water/acetic acid 34/1.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time (min)** | **Eluent% A** | **Eluent %B** | **Rate (mL/min)** |
| 0  15 | 70  70 | 30  30 | 1.0  1.0 |

Rate: 1(mL/min).

Oven temperature: 30°C.

Volume injected: 20µL.

Retention times (min): 4.9 for brodifacoum I and 5.4 for brodifacoum II.

Linearity was performed with 5 calibration standards, prepared in methanol, from 0.51 to 1.50mg/L. The same linearity was used for the determination of active substance in the product FANGA PATE PRO and FANGA BLOC SP PRO.

Precision was performed by analyzing twice five samples of FANGA BLOC SP PRO. The extraction is the same as for FANGA PATE PRO.

Specificity and accuracy were performed with the formulation FANGA PATE PRO:

Test item: FANGA PATE PRO, Batch 308/11/01.

Blank formulation: (FANGA PATE PRO): Batch 311/11.

Reference item : brodifacoum, purity 99.3%, batch SZB8324XV (supplier: SIGMA Aldrich).

Results are summarized in the following table.

Table 3: Analytical method for the determination of brodifacoum (reverse phase HPLC-UV)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Test substance** | **Analytical method** | **Fortification range/ number of measurements** | **Linearity** | **Specificity** | **Recovery rate (%)** | | | **Repeatability** | **Reference** |
| **range** | **Mean** | **St dev.** |
| FANGA PATE PRO  Batch 308/11/01  Blank formulation  Batch 311/11 | brodifacoum | reverse phase HPLC-UV | Fortification levels: reconstituted sample at 1 concentration level (0.005%, 1mg/L in solution after dilution)  two samples prepared and analysed in duplicate | 0.51-1.50mg/L  Y= 1.4717x -0.09  R2=0.9965 | No interference observed | 100-102%  two reconstituted sample in duplicate at 0.005% of active substances (1mg/L) | 101% | SD: 0.8  RSD: 0.8% | 5 samples (FANGA BLOC PRO) in duplicate  Mean: 0.0045% (w/w)  SD:0.0001  RSD: 2.90%  Horwitz value: 6.04 | RICAU hélène, report No. 11-920010-015, May 2012  RICAU Hélène, report No. 11-920010-019, May 2012 |

Chromatograms were provided for the formulation blank, reference item and test item (at 0.005%). No interference has been observed at the retention time of brodifacoum. Specificity of the method is acceptable.

Linearity has been demonstrated with 5 calibration standards.

According to Sanco/3030/99 rev.4, recoveries should be between 80-120% for active substances with nominal content below 0.01%. Accuracy is acceptable.

RSD is below Horwitz value. Repeatability is acceptable.

It is concluded that the provided method is validated and acceptable for the product FANGA PATE PRO.

|  |
| --- |
| * **Major change application – FANGA PATE 25 – 2018** |
| For the major change of application, new analytical methods are provided   |  | | --- | | Report: Analytical method validation for the determination of brodifacoum in the FANGA BLOC SP PRO, RICAU, H. 2012  Study GLP n° 11-920010-015 |   Test facility: DEFITRACES Z.A. des Andrés 150, rue Pré-Magne 69126 BRINDAS FRANCE  Principle of the method:  A method to determine brodifacoum in the biocidal product FANGA BLOC SP PRO by HPLC – UV was submitted. The test item is quantified by HPLC method (Column: reversed phase) using UV detection (265 nm) after extraction.  The validation of this method was considered in compliance with SANCO 3030/99 rev 4.  Validation data:   |  |  |  |  | | --- | --- | --- | --- | | Specificity | To demonstrate the specificity of the method, four solutions are analysed and chromatograms have been provided for:   * Solvent blank * Formulation blank * Reference item * Test item   No interference was found: no peak appears in the formulation blank and solvent blank at the retention time of brodifacoum.  The method is specific to brodifacoum in FANGA BLOC SP PRO. | | | | Linearity | Linearity was studied by carrying out five concentrations between 50% and 150% of the concentration in the test item. (= between 0.49 mg/L and 1.48 mg/L). | | | | Compound | Linearity % | | | Brodifacoum | 0.49 mg/L to 1.48 mg/L  Y = 1.4717 X – 0.09  R = 0.9965  n = 5 | | | Precision | Repeatability was evaluated by analysing twice five test item solutions. | | | | Compound | Mean (% w/w) | Repeatability (RSD) | | Brodifacoum | 0.0045% | 2.90% | | Accuracy | Accuracy was determined by comparison of the reference items and 2 reconstituted test item solution at 100% and 109% of the theoretical concentrations of 1 mg/mL. Two injections of each preparation are made. The accuracy results are expressed as the recovery rate.   |  |  |  |  | | --- | --- | --- | --- | | Fortification level | Recovery rate (%) | Mean recovery rate (%) | n | | 100%  (1.00 mg/mL) | 101-100 | 101 | 2 | | 109%  (1.09 mg/mL) | 98-98 | 98 | 2 | | | |  |  | | --- | | Report: Validation of the analytical method for the determination of brodifacoum in BDPA25V1, THEBAULT, A. 2016  Study GLP n° 16-920010-003 |   Test facility: DEFITRACES Z.A. des Andrés 150, rue Pré-Magne 69126 BRINDAS FRANCE  Principle of the method:  A method to determine brodifacoum in the biocidal product BDPA25V1 (FANGA PATE 25) by HPLC – UV was submitted. The test item is quantified by HPLC method (Column: reversed phase) using UV detection (265 nm) after extraction.  The validation of this method was complementary with analytical method validation perfomed on FANGA BLOC SP PRO (study GLP n°11-920010-015) by definition of the specicity and the accuracy of the method.The validation of this method was considered in compliance with SANCO 3030/99 rev 4  Validation data:   |  |  | | --- | --- | | Specificity | To demonstrate the specificity of the method, four solutions are analysed and chromatograms have been provided for:   * Solvent blank * Formulation blank * Reference item * Test item   No interference was found: no peak appears in the formulation blank and solvent blank at the retention time of brodifacoum.  The method is specific to brodifacoum in BDPA25V1. | | Accuracy | Accuracy was determined by comparison of the reference items and 2 reconstituted test item solution at 98% and 103% of the theoretical concentrations of 1 mg/mL. Two injections of each preparation are made. The accuracy results are expressed as the recovery rate.   |  |  |  |  | | --- | --- | --- | --- | | Fortification level | Recovery rate (%) | Mean recovery rate (%) | n | | 98%  (0.98 mg/mL) | 97.1-97.6 | 97.4 | 2 | | 103%  (1.03 mg/mL) | 97.7-97.7 | 97.7 | 2 | |   Analytical methods for determining relevant components and/or residues in different matrices  The analytical methods for determination of residues of active substance in different matrices (soil, air, drinking and surface water, body fluids and tissues, in food and feedstuff) provided in the CAR of the active substance are presented in annex 3 of this document.  Since there is no risk of contact with alimentation, no analytical method is required for the determination of brodifacoum residues in food and feedstuff.   |  | | --- | | **Conclusion on the method for detection and identification of Brodifacoum** | | Provided analytical methods are fully validated for the determination of the active substance brodifacoum at 50 ppm in the product FANGA BLOC SP PRO and at 25 ppm in the product BDPA25V1 (FANGA PATE 25).  For the analytical methods for determining relevant components and/or residues in different matrices, remain unchanged. | |

## Risk assessment for Physico-chemical properties

FANGA PATE PRO is a ready-to-use paste bait. The product is not highly flammable, not auto-flammable (up to 400°C), not explosive and does not have oxidizing properties

The product is stable 14 days at 54°C in paper sachets. A provisional shelf life of 2 years can be granted.

***Risk mitigation measures linked to assessment of physico-chemical properties***

* Store away from light.

***Required information linked to assessment of physico-chemical properties***

* A shelf life study (2 years at ambient temperature) with monograph GIFAP n°17.

|  |
| --- |
| * **Major change application FANGA PATE PRO – 2016** |
| Based on the new data submitted for the major application change the biocidal product FANGA PATE PRO was considered to be stable after 24 months of storage procedure at ambiant temperature. The product is compatible with all new claimed packaging. No further data are required. |

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| FANGA PATE 25 is a ready-to-use paste bait. The product is not highly flammable, not auto-flammable (up to 400°C), not explosive and does not have oxidizing properties according to GHS guideline. FR considers these conclusions are still valid for CLP classification as no formulant is expected to be classified for PC CLP properties.  The biocidal product is stable 14 days at 54°C in PP bucket, metallic can and Cardboard box. Considering the product is a solid and it is compatible with PP bucket, metallic can and Cardboard box, compatibility with other claimed packagings is considered acceptable.  The accelerated storage of the product indicates that the biocidal product is expected to be stable 2 years at ambient temperature.  eCA recommends to store away from light due to the sensitivity of the active substance to light.  Its technical characteristics are acceptable for a ready to use paste bait formulation.  Analytical methods are acceptable. |

|  |
| --- |
| * **Renewal application for FANGA PATE 25 – 2019** |
| A long-term storage study was provided on FANGA PATE 25. Shelf life is set at 30 months in PP, metal can and cardboard box. |

## Effectiveness against target organisms

### Function

MG 03: Pest Control.

Product Type 14: Rodenticide.

### Organisms to be controlled and products, organisms or objects to be protected

According to the uses claimed by the applicant during the first authorisation, the product FANGA PATE PRO is intended to be used to control rats and mice. The target organisms to be controlled are *Mus musculus*, *Rattus norvegicus* *and Rattus rattus*.

FANGA PATE PRO is used indoor by professional users.The products, organisms or objects to be protected are public and private buildings, and farms.

The application rates recommended by the applicant are the following:

Rats: 180 g paste/secured bait point separated by 5-10 m.

Mice: 30 g paste/secured bait point separated by 1-2 m.

### Effect on target organisms and efficacy

Brodifacoum is a second-generation single dose anticoagulant which prevents blood clotting in the target.

Clinical signs are progressive and occur three days after the ingestion of a toxic dose, leading to the death of target animal within 4 to 9 days after, according to the laboratory tests performed.

* Study n°:: laboratory study:

For brown rats (*Rattus norvegicus*), the mean overestimated palatability percentage is 14.3 % (recalculated to 9.5 %) and the mortality percentage of 90%.

For house mice (*Mus musculus*): the mean overestimated palatability percentage is 8.7 % (recalculated to 5%) and the mortality percentage of 60 %.

Considering the results obtained in these trials, efficacy of the product FANGA PATE PRO is not proved.

Following the applicant’s consultation, new efficacy and palatability laboratory studies and also field studies, reported below, have been performed to complete the efficacy part of the dossier.

* Study n° 12: laboratory study:

For brown rats (*Rattus norvegicus*), the mean palatability percentage was 44 % and the mortality percentage was 90%. Death occurs between day 4 to day 7

* Study n° 12: laboratory study:

For house mice (*Mus musculus*), the mean palatability percentage was 65 % and the mortality percentage was 100 %. Death occurs between day 4 to day 9.

* Study n°12: field study:

For brown rats (*Rattus norvegicus*), the assessed bait has been very well accepted and the efficacy was estimated at 100 %.

* Study n°12: field study:

For house mice (*Mus musculus*), the assessed bait has been very well accepted and the efficacy was estimated at 100 %.

French competent authorities (FR CA) consider that the elements presented in the dossier are sufficient to demonstrate the efficacy of the product against mice (*Mus musculus*) and against brown rats (*Rattus norvegicus)*. However, FR CA considers that for the claim ”use against rats”, efficacy must be shown on both species *R. norvegicus* and *R. rattus*. Considering that no supporting data on *Rattus rattus* were provided, suitable information (such as a field test) demonstrating the efficacy of FANGA PATE PRO against black rat, will need to be provided in support of the authorisation.

All efficacy studies are presented in annex 9.

|  |
| --- |
| * **Major change application and** **the post-authorisation requirements – 2016** |
| According to the new uses claimed by the applicant in the frame of major change application, FANGA PATE PRO is intended to be used to control rats and mice in and around buildings, open areas by professional and non-professional users and in waste dumps and landfills by professional. The target organisms to be controlled are *Mus musculus*, *Rattus norvegicus* and *Rattus rattus*.  The application rates recommended by the applicant are the following:  In and around buildings, open areas and waste dumps   * Rats: 180 g per baiting point separated by 5 -10 m. * Mice: 30 g per baiting point separated by 1 - 2 m.   The products, organisms or objects to be protected are public and private buildings, farms, opens areas and waste dump sites.  For the major application change and the post-authorisation requirements, the applicant submitted following studies:  Study n°2008.: field study  For black rats (Rattus rattus), the assessed bait FANGA B+ has been very well accepted and the efficacy was estimated at 100 %. The composition of the FANGA B+ and the FANGA PATE PRO are very closed excepted for the concentration of active substance which is lower for FANGA B+ (0.001 % w/w a.i) than for FANGA PATE PRO (0.005% w/w a.i). Nevertheless, as the application rate used (200 g/bait point) in this study is higher than the application rate claimed (180 g/ bait point). Then the results can be taken into account.  Study n°2012.: field study  For brown rats (Rattus norvegicus), the assessed 29 month aged bait has been very well accepted and the efficacy was estimated at 100 %.  Study n°2013.: field study  For black rats (Rattus *norvegicus*), the assessed 29 month aged bait bait has been very well accepted and the efficacy was estimated at 100 %.  Study n°2014.: field study  For house mice (*Mus musculus*), the assessed 39 month aged bait has been very well accepted and the efficacy was estimated at 100 %.  French competent authorities (FR CA) consider that the elements presented in the dossier are sufficient to demonstrate the efficacy of the product against mice (*Mus musculus*) brown rats (*Rattus norvegicus*) and black rats (*Rattus rattus*).  All efficacy studies are presented in annex 9.  Consequently, the product FANGA PATE PRO (0.005 % w/w brodifacoum) has shown a sufficient efficacy and can be used for the control of rats (*Rattus norvegicus* and *Rattus rattus*) and house mice (*Mus musculus*) at doses claimed.  Uses and doses validated for FANGA PATE PRO are the following :   |  |  |  |  | | --- | --- | --- | --- | | **Product** | **Target organisms** | **Application rate and intervals** | **Use area** | | FANGA PATE PRO  Bait containing 0.005% w/w of brodifacoum. | Rats (*Rattus norvegicus and Rattus rattus*) | 180 g / bait point separated by 5 - 10 meters | In and around building, open areas, waste dumps and landfills | | Mice (*Mus musculus*) | 30 g / bait point separated by 1 - 2 meters | In and around building, open areas, waste dumps and landfills | |

|  |
| --- |
| * **Major change application FANGA PATE 25 – 2018** |
| According to the uses claimed by the applicant in the frame of major change application, FANGA PATE 25 is intended to be used to control rats and mice in and around buildings, and in open areas by professional and non-professional users, and only by professional users in waste dumps and landfills. The target organisms to be controlled are *Mus musculus*, *Rattus norvegicus* and *Rattus rattus*.  To support the efficacy of the new formulation of the product FANGA PATE 25 for which the concentration of active substance in the formulation is decreased to 0.0025 % w/w brodifacoum, the applicant has submitted five studies with the product FANGA B+.  The main difference between both products is the concentration of active substance: FANGA B+ contains 0.001 % w/w of brodifacoum and FANGA PATE 25 contains 0.0025% w/w of brodifacoum, other components are the same to nearly the same concentrations. Therefore efficacy studies conducted with FANGA B+ are acceptable to demonstrate the efficacy of FANGA PATE 25.  The composition of FANGA B+ is presented in the confidential part of the PAR.   * Study n° 12 TOX024-4: laboratory study:   For house mice (*Mus musculus*): the mean overestimated palatability percentage is 61 % and the mortality percentage of 100 %.   * Study n° 13 TOX019: field study:   For house mice (*Mus musculus*), the assessed bait has been very well accepted and the efficacy was estimated at 100 %.   * Study n° 12 TOX024-03: laboratory study:   For brown rats (*Rattus norvegicus*), the mean palatability percentage was 43 % and the mortality percentage was 90%. Death occurs between day 4 to day 7.   * Study n° 13 TOX020: field study:   For brown rats (*Rattus norvegicus*), the assessed bait has been very well accepted and the efficacy was estimated at 100 %.   * Study n° 2001.BCD.SAG15: field study:   For black rats (*Rattus rattus*), the assessed 3 years aged bait has been very well accepted and the efficacy was estimated at 100 %.  Submitted efficacy data are compliant with the requirements of the TNsG PT14 (2009) and the results of these tests are respecting the criteria of the TNsG PT14 (2009).  French competent authorities (FR CA) assessed that the product FANGA PATE 25 has shown sufficient efficacy and can be used for the control of rats (*Rattus norvegicus* and *Rattus rattus*) at the claimed application rate of 180-200g / bait station and, house mice (*Mus musculus*), at the claimed application rate of 30 g /bait station.  To ensure a satisfactory level of efficacy and avoid the development of resistance, the recommendations specified in the SPC have to be implemented.  Uses and doses validated for the major change of FANGA PATE 25 are the following :   |  |  |  |  | | --- | --- | --- | --- | | **Product** | **Target organisms** | **Application rate and intervals** | **Use area** | | FANGA PATE 25  Bait containing 0.0025% w/w of brodifacoum. | Rats (*Rattus norvegicus* and *Rattus rattus)* | 180-200 g / bait point separated by 5 - 10 meters | In and around building, open areas, waste dumps and landfills | | Mice (*Mus musculus*) | 30 g / bait point separated by 1 - 2 meters | In and around building, open areas | |

|  |
| --- |
| * **Minor change application FANGA PATE 25 – 2018** |
| To support the efficacy of the new claimed application rate against rats the applicant has submitted two field tests with the product FANGA B+.  The main difference between both products is the concentration of active substance: FANGA B+ contains 0.001 % w/w of brodifacoum and FANGA PATE 25 contains 0.0025 % w/w of brodifacoum, other components are the same to nearly the same concentrations. Therefore efficacy studies conducted with FANGA B+ are acceptable to demonstrate the efficacy of FANGA PATE 25.  The composition of FANGA B+ is presented in the confidential part of the PAR.  All efficacy studies results are presented in annex 9 and the compositions of all tested products are presented in the confidential part of the PAR.  Submitted efficacy data are compliant with the requirements of the TNsG PT14 (2009) and the results of these tests are respecting the criteria of the TNsG PT14 (2009).  French competent authorities (FR CA) consider that the elements presented in the dossier confirm the efficacy of the product FANGA PATE 25 against rats (*Rattus norvegicus* and *Rattus rattus*) at the claimed application rate of 100 g / bait point:   * For professional users: in and around buildings, and waste dumps. * For non professional users: in and around buildings. |

|  |
| --- |
| * **Renewal application for FANGA PATE 25 - 2019** |
| For the renewal of the product FANGA PATE 25 (0.0025 % w/w brodifacoum), no change in the composition has been declared. The efficacy evaluation is based on the efficacy studies submitted by the applicant for the first authorisation requirements and the minor application change.  The product FANGA PATE 25 (0.0025 % w/w brodifacoum) has shown a sufficient efficacy and can be used for the control of rats (Rattus norvegicus and Rattus rattus) and house mice (Mus musculus) at doses claimed. |

### Mode of action including time delay

Brodifacoum acts as a vitamin K antagonist. It interferes with the regeneration of prothrombin disturbing the normal blood clotting mechanisms and increasing tendency to bleed.

The main site of its action is the liver, where several of the blood coagulation precursors under vitamin-K dependent post translation processing take place before they are converted into the respective procoagulant zymogens.

Brodifacoum works by blocking the regeneration of vitamin K 2,3-epoxide to vitamin K hydroquinone. Since the amount of vitamin K in the body is finite, the progressive block of the regeneration of vitamin K will lead to an increasing probability of a fatal haemorrhage.

Death of target animal occurs 4 to 9 days after ingestion.

### Occurrence of resistance - resistance management / Unacceptable effect

Resistance to the first generation anticoagulants has been widely reported in both *Rattus norvegicus* and *Mus domesticus* since the late 1950's. The incidence of resistance to first generation anticoagulants in areas in which it is established is commonly 25-85%. Some degree of resistance to difenacoum has been reported in the UK, Denmark, France and Germany but this is usually found in certain populations of rodents highly resistant to first generation anti-coagulants (Greaves et al., 1982[[6]](#footnote-7); Lund, 1984[[7]](#footnote-8); Pelz et al. 1995[[8]](#footnote-9)). The resistance factor tells how much the anticoagulant dose has to be multiplied to kill resistant individuals compared to sensitive ones. The resistant factors for difenacoum in the brown rats ranged from 1.1 to 8.6 (Greaves and Cullen-Ayres 1988[[9]](#footnote-10)). The study included rats resistant to warfarin and difenacoum. Resistance factors for warfarin ranged from approx. 50 to 2300. Greaves et al. (1982) reported a fivefold difenacoum dose needed to kill difenacoum resistant rats. Considerable doubt exists as to the significance of reports in UK of resistance to second-generation anticoagulants and in the UK control failures with the second-generation products are increasingly being attributed to baiting problems rather than physiological resistance (Greaves and Cullen Ayres, 1988; Quy et al. 1992a,b[[10]](#footnote-11)).

Recent studies carried out in different European countries, in the UK more particularly (xxx *et al*, 2001; see annex 1) revealed the occasional occurrence of cross-resistances to second-generation anticoagulants, such as difenacoum and bromadiolone on resistant brown rats (*Rattus norvegicus*) populations to coumafene. Moreover, a recent publication (xxx *et al*., 2012) has demonstrated that the majority (91%) of warfarin resistant rat trapped in East and West parts of Belgium were also resistant to bromadiolone. The rats trapped in the region of Flanders (Northern Belgium) carried mutation Y139F. This mutation is found extensively in France where it also confers resistance to bromadionone (xxx *et al*., 2009). More recently, the same mutation was also found in UK (xx *et al*., 2011) where applications of bromadiolone had been unsuccessful. Difenacoum is also thought to be partially resisted by rats which carry Y139F. So, resistance to second generation anticoagulant rodenticides should not be minimized.

Only an exhaustive study carried out at the French and European levels could enable to point-out resistant areas with first-generation anticoagulants and potential cross-resistances to second-generation anticoagulants. It is one of the actions undertaken since 2010 in France by a group of scientists (Rodent program “*impacts of anticoagulants rodenticides on ecosystems-adaptations of target rodents and effects on their predators*”).

*Resistance management strategies*

The immediate aim of resistance management is to prevent or retard the development of resistance to a given anticoagulant while, as far as is not counterproductive, permitting its continued use. The ultimate aim is to reduce or eliminate the adverse consequences of resistance.

CropLife International has published a strategy for resistant management of rodenticides (RRAC 2003). The habitat management is addressed in the strategy in addition to chemical control. The access of rodents should be restricted by physical barriers and no food should be available for rodents. Rotation between different anticoagulants is not a reliable means of managing the anticoagulant resistance, as all anticoagulants have the same mode of action and the nature of resistance is also similar. The resistant individuals can be identified by conducting a blood clotting response (BCR) test (xxx et al. 1993, RRAC 2003). The problem with the BCR test is that it has proven difficult to standardize and it produces both false positives and negatives (xxxet al. 2005). In order to follow the occurrence and spread of difenacoum resistance, wild rats should be continuously monitored for resistance in the rodent controlled area. The recommendations of CropLife International are quoted below.

**To avoid the development of resistance in susceptible rodent populations:**

* When anticoagulant rodenticide is used, ensure that all baiting points are inspected weekly and old bait replaced where necessary.
* Undertake treatment according to the label until the infestation is completely cleared.
* On completion of the treatment remove all unused baits.
* Do not use anticoagulant rodenticides as permanent baits routinely. Use permanent baits only where there is a clear and identified risk of immigration or introduction or where protection is afforded to high-risk areas.
* Monitoring of rodent activity should be undertaken using visual survey, through the use of non-toxic placebo monitors or by other effective means.
* Record details of treatment.
* Where rodent activity persists due to problems other than resistance, use alternative baits or baiting strategies, extend the baiting programme or apply alternative control techniques to eliminate the residual infestation (acute or sub-acute rodenticides, gassing or trapping).
* Ensure that complete elimination of the infestation is achieved.
* As appropriate during the rodenticide treatment, apply effective Integrated Pest Management measures (remove alternative food sources, water sources and harbourage and, proof susceptible areas against rodent access).

**Treatment of rodent infestations containing resistant individuals:**

* Where rodent infestations containing resistant individuals are identified, immediately use an alternative anticoagulant of higher potency. If in doubt, seek expert advice on the local circumstances.
* Alternatively use an acute or sub-acute but non-anticoagulant rodenticide.
* In both cases it is essential that complete elimination of the rodent population is achieved. Where residual activity is identified apply intensive trapping to eliminate remaining rodents. Gassing or fumigation may be useful in specific situations.
* Apply thorough Integrated Pest Management procedures (environmental hygiene, proofing and exclusion).
* Do not use anticoagulant rodenticides as permanent baits as routine. Use permanent baits only where there is a clear and identified risk of immigration or introduction or where protection is afforded to high risk areas.
* Record details of treatment.

**Application of rodent control in area or block to eliminate resistance:**

* Where individual infestations are found to be resistant or contain resistant individuals it is possible that the resistance extends further to neighboring properties.
* Where there are indications that resistance may be more extensive than a single infestation, apply control rodent programs in the whole area or block.
* The area under such management should extend at least to the boundaries of the area known resistance and ideally beyond.
* These programmes must be effectively coordinated and should encompass the procedures identified above.

The authorisation holder should report any observed resistance incidents to the Competent Authorities (CA) or other appointed bodies involved in resistance management every two years.

|  |
| --- |
| * **Major change application FANGA PATE 25 – 2018** |
| Resistance to the first generation anticoagulants has been widely reported in both *Rattus norvegicus* and *Mus domesticus* since the late 1950's. The incidence of resistance to first generation anticoagulants in areas in which it is established is commonly 25-85%.  The enzyme vitamin K 2, 3 epoxide reductase (VKOR) is the target for anticoagulants. Modifications in the protein structure due to polymorphisms on the gene coding the VKOR may induce anticoagulant resistance. Most resistant strains are characterised by one single nucleotide polymorphism (SNP). These SNPs cause the exchange of one amino acid in the VKOR enzyme. The biochemical mechanism of anticoagulant resistance has been studied in several geographic strains/VKORC1-variants of the Norway rat. Amino acid substitutions in the VKOR seem to alter its structure and function, resulting in decreased sensitivity to anticoagulant inhibition, depending on strain characteristics.  For house mice, a dominant autosomal warfarin-resistance gene was determined on chromosome 7 in house mice. Three VKORC1 sequence variants mediating resistance to anticoagulants seem to be widely distributed. House Mice carrying the homozygous of one of these variants (Y139C) were found highly resistant to warfarin and bromadiolone.  For roof rats, experiments on warfarin resistant rats indicated considerable instability in the resistance and suggested a multifactorial basis for resistance.  Some degree of resistance to difenacoum has been reported in the UK, Denmark, France and Germany but this is usually found in certain populations of rodents highly resistant to first generation anti-coagulants (xxx et al., 1982[[11]](#footnote-12); Lund, 1984[[12]](#footnote-13); xxx et al. 1995[[13]](#footnote-14)). The resistance factor tells how much the anticoagulant dose has to be multiplied to kill resistant individuals compared to sensitive ones. The resistant factors for difenacoum in the brown rats ranged from 1.1 to 8.6 (xxx and xxx 1988[[14]](#footnote-15)). The study included rats resistant to warfarin and difenacoum. Resistance factors for warfarin ranged from approx. 50 to 2300. xx et al. (1982) reported a fivefold difenacoum dose needed to kill difenacoum resistant rats. Considerable doubt exists as to the significance of reports in UK of resistance to second-generation anticoagulants and in the UK control failures with the second-generation products are increasingly being attributed to baiting problems rather than physiological resistance (xxx and xx Ayres, 1988; xxx et al. 1992a,b[[15]](#footnote-16)).  Studies carried out in different European countries, in the UK more particularly (xxxet al, 2001; see annex 1) revealed the occasional occurrence of cross-resistances to second-generation anticoagulants, such as difenacoum and bromadiolone on resistant brown rats populations to coumafene. Moreover, a publication (Baer et al., 2012) has demonstrated that the majority (91%) of warfarin resistant rat trapped in East and West parts of Belgium were also resistant to bromadiolone. The rats trapped in the region of Flanders (Northern Belgium) carried mutation Y139F. This mutation is found extensively in France where it also confers resistance to bromadiolone (xxx et al., 2009). The same mutation was also found in UK (xx et al., 2011) where applications of bromadiolone had been unsuccessful. Difenacoum is also thought to be partially resisted by rats which carry Y139F.  House mice carrying the homozygous Y139C sequence variant were found to be highly resistant to warfarin and bromadiolone.  So, resistance to second generation anticoagulant rodenticides should not be minimized.  An exhaustive study carried out at the French and European levels could enable to point-out resistant areas with first generation anticoagulants and potential cross-resistances to second-generation anticoagulants. It is one of the actions undertaken since 2010 in France by a group of scientists (Rodent program “impacts of anticoagulants rodenticides on ecosystems-adaptations of target rodents and effects on their predators”).  The document CropLife International (RRAC 2015) provides guidance to advisors, national authorities, professionals, practitioners and others on the nature of anticoagulant resistance in rodents, the identification of anticoagulant resistance, strategies for rodenticide application that will avoid the development of resistance and the management of resistance where it occurs.  The following are the essential elements of an effective program: survey, use of physical and chemical control techniques, environmental management, record keeping, monitoring and review.  The authorization holder should report any observed resistance incidents to the Competent Authorities or other appointed bodies involved in resistance management at the renewal of the product.  To ensure a satisfactory level of efficacy and avoid the development of resistance, the recommendations proposed in the SPC have to be implemented. |

|  |
| --- |
| * **Renewal application for FANGA PATE 25 - 2019** |
| A statement has been provided by the applicant indicating that the surveys implemented don’t outline any issues for resistance in the field. Nevertheless, it has to be noticed that rodenticides baits are commonly challenged by the presence of other food. |

To ensure a satisfactory level of efficacy and avoid the development of resistance, the recommendations proposed in the SPC have to be implemented.

### Evaluation of the label claim

For first authorisation, French competent authorities (FR CA) assessed that the product FANGA PATE PRO has shown a sufficient efficacy for the control of house mice (*Mus musculus*) and brown rats (*Rattus norvegicus)*. But for the claim ”use against rats”, efficacy must also be shown on black rats (*R. Rattus)*. So, in the absence of supporting data on *Rattus rattus*, suitable information (such as a field test) demonstrating the efficacy of FANGA PATE PRO against black rat will need to be provided in support of the authorisation.

Label has to be revised as following:

- Inspections of bait points have to be made 3 days after the first application then weekly for use in building.

The application rates validated are the following :

House mice (Mus musculus): 30 g pasta/secured bait point separated by 1-2 m.

Rats (Rattus norvegicus and Rattus rattus): 180 g pasta/secured bait point separated by 5-10 m

The product FANGA PATE PRO is supplied in 10g sachets. The amount of bait per bait station or bait points must not exceed the recommended application rates.

|  |
| --- |
| * **Major change application for FANGA PATE PRO – 2016** |
| Regarding the major change, French competent authorities (FR CA) assessed that the product FANGA PATE PRO has shown a sufficient efficacy for the control of *Rattus norvegicus*, *Rattus rattus* and *Mus musculus*. The previous application rates have been confirmed. |

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| French competent authorities (FR CA) assessed that the elements presented in the dossier confirm, when the concentration of active substance in the formulation is decreased to 0.0025 % w/w brodifacoum, the efficacy of the product FANGA PATE 25 against house mice (*Mus musculus*), black rats (*Rattus rattus*) and brown rats (*Rattus norvegicus*).  The application rates validated are the following:   |  |  |  |  | | --- | --- | --- | --- | | **Product** | **Target organisms** | **Application rate and intervals** | **Use area** | | FANGA PATE 25  Bait containing 0.0025% w/w of brodifacoum. | Rats (*Rattus norvegicus* and *Rattus rattus)* | 180-200 g / bait point separated by 5 - 10 meters | In and around building, open areas, waste dumps and landfills | | Mice (*Mus musculus*) | 30 g / bait point separated by 1 - 2 meters | In and around building, open areas | |

|  |
| --- |
| * **Minor change application for FANGA PATE 25 – 2018** |
| French competent authorities (FR CA) assessed that the product FANGA PATE 25 has shown a sufficient efficacy for the control of rats (*Rattus norvegicus and Rattus rattus*) in and around buildings by professional and non professional users and, in waste dumps and landfills by professional users only, at the application rate of 100 g / bait point. |

|  |
| --- |
| * **Renewal application for FANGA PATE 25 - 2019** |
| The application rates validated are the following:   * Rats (*Rattus norvegicus* and *Rattus rattus*): 100 g bait point separated by 5-10 m. * Mice (*Mus musculus*): 30 g / bait point separated by 1-2 m.   To ensure a satisfactory level of efficacy and avoid the development of resistance, the recommendations proposed in the SPC have to be implemented. |

### Conclusion of the efficacy assessment

The product FANGA PATE PRO has shown a sufficient efficacy and can be used for the control of house mice (*Mus musculus*) and brown rats (*Rattus norvegicus*).

French competent authorities (FR CA) assessed that the product FANGA PATE PRO has shown a sufficient efficacy for the control of *Rattus norvegicus*. But for the claim ”use against rats”, efficacy must be also shown on *R. Rattus*. Consequently, in the absence of supporting data on *Rattus rattus*, suitable information (such as a field test) demonstrating the efficacy against black rat of FANGA PATE PRO will need to be provided in support of the authorisation. Field tests against all the target organisms (*Rattus rattus, Rattus norvegicus and Mus musculus)* performed with a 2 years old product must be submitted to support the storage duration of 2 years.

The authorisation holder should report any observed resistance incidents to the Competent Authorities (CA) or other appointed bodies involved in resistance management every two years.

***Conditions of use linked to efficacy assessment***

* Adapt the number of bait points to the infestation level.
* Inspect and resupply the bait points, 3 days after application then once a week as long as the bait is consumed.
* Remove all bait points after the end of treatment.
* The amount of bait per bait point and distances between bait points must be respected. Products have always to be used in accordance with the label.
* The users should inform is the treatment is ineffective and report straightforward to the registration holder any alarming signals which could be assumed to be resistance development.
* To avoid resistance, professional users must:
* use the treatment alternately with other kinds of active substances having different modes of action;
* adopt integrated pest management methods such as the combination of chemical, physical control methods and other public health measures;
* monitor the level of efficacy (periodic check), and investigate the case of reduced efficacy for possible evidence of resistance;
* not use the product in areas where resistance is suspected or established.

***Recommandations to be taken into account by the applicant***

* Adapt the amount of bait per bait point to the validated effective dose.
* The product label has to contain information on resistance management for rodenticides.

***Required information linked to efficacy assessment***

* The authorisation holder has to monitor the resistance phenomenon of rodent populations toward the active substance brodifacoum, and resistance strategies management must be put in place. Results of the resistance monitoring must be submitted to the Competent Authorities (CA) or other appointed bodies involved in resistance management every 2 years.
* Field tests against all the target organisms (*Rattus rattus, Rattus norvegicus and Mus musculus)* performed with a 2 years old product must be submitted to support the storage duration of 2 years.

|  |
| --- |
| * **Major change application for FANGA PATE PRO 2016** |
| ***Conditions of use linked to efficacy assessment (non-professional users)***   * The amount of bait per bait point and distances between bait points must be respected. * Products have always to be used in accordance with the label. * Inspect and resupply the bait stations as long as the bait is consumed, 3 days after the first application then weekly in and around building and in open areas. * Remove all bait stations after the end of treatment. * The users should inform if the treatment is ineffective and report straightforward to the registration holder any alarming signals which could be assumed to be resistance development.   The conditions of use linked to efficacy assessment for the professional users remain unchanged. |

|  |
| --- |
| * **Major change application for FANGA PATE 25 2018** |
| French competent authorities (FR CA) assessed that the product FANGA PATE 25 has shown a sufficient efficacy for the control of mice (*Mus musculus*) and rats (*Rattus norvegicus and Rattus rattus*) in and around buildings and in open areas by professional and non-professional users and only by professional users in waste dumps and landfills.  To ensure a satisfactory level of efficacy and avoid the development of resistance, the recommendations proposed in the SPC have to be implemented. |

|  |
| --- |
| * **Renewal application for FANGA PATE 25 - 2019** |
| The application rates validated are the following:   * Rats (*Rattus norvegicus* and *Rattus rattus*): 100 g bait point separated by 5-10 m. * Mice (*Mus musculus*): 30 g / bait point separated by 1-2 m. |

## Description of the intended use

The product FANGA PATE PRO is intended to be used for the control of rodents indoor by professional users. The target species claimed by the applicant are mice and rats.

**Efficacy is demonstrated at the following dosage:**

**Rats: 180 g paste/secured bait point separated by 5-10 m. (indoor only)**

**House mice: 30 g paste/secured bait point separated by 1-2 m. (indoor only)**

The product is a ready-to-use paste bait with no dilution nor other substances added for application. The mode of application claimed by the applicant is a manual application by professional users in secured bait point (bait stations).

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| The product FANGA PATE 25 is intended to be used against house mice (Mus musculus), black rats (Rattus rattus) and brown rats (Rattus norvegicus) for use in and around buildings and in open areas by professional and non-professional users, and only by professional users in waste dumps and landfills.  Efficacy is demonstrated at the following dosage:   * Rats: 180-200 g paste/secured bait point separated by 5-10 m. * House mice: 30 g paste/secured bait point separated by 1-2 m. |

|  |
| --- |
| * **Minor change application for FANGA PATE 25 – 2018** |
| The product FANGA PATE 25 is intended to be used against house mice (*Mus musculus*), black rats (Rattus rattus) and brown rats (*R*a*ttus norvegicus*) for use in and around buildings and in open areas by professional and non-professional users, and only by professional users in waste dumps and landfills.  Efficacy is demonstrated at the following dosage:   * Rats: 100 g paste/secured bait point separated by 5-10 m. * House mice: 30 g paste/secured bait point separated by 1-2 m. |

|  |
| --- |
| * **Renewal application for FANGA PATE 25 - 2019** |
| The product FANGA PATE 25 is intended to be used against black rats (Rattus rattus), brown rats (*R*a*ttus norvegicus*) and mice (*Mus musculus*) for use in and around buildings and in open areas by professional and non-professional users, and only by professional users in waste dumps and landfills.  Efficacy is demonstrated at the following dosage:   * Rats: 100 g paste/secured bait point separated by 5-10 m. * Mice: 30 g grains/secured bait point separated by 1-2 m. |

## Risk assessment for human health

### Hazard potential

#### Toxicology of the active substance

The toxicology of the active substance was examined extensively according to standard requirements.

The results of this toxicological assessment can be found in the **combined Assessment Report**. Brodifacoum (CAS no. 56073-10-0) was notified as an existing active substance, by Syngenta Limited and Activa / Pelgar Brodifacoum and Difenacoum Task Force[[16]](#footnote-17), hereafter referred to as the “AS applicants”, in product-type 14. A combined assessment report was available on December 2010.

The following corresponds to the summary of the effect assessment available in the combined assessment report of brodifacoum.

* **Toxicokinetics**

***Data from Syngenta:***

*Brodifacoum* (0.21 mg/kg bw) administered orally to rats was rapidly absorbed (Tmax =8h; Cmax 16.1 ng/ml whole blood). The levels declined slowly and about 10% (1.3 ng/ml) was still present at 10 days after dosing. Almost all (82.5 %) the radioactivity in whole blood was found to be associated with the plasma. Based on the radioactivity still associated to the animal tissues, 10 days after the treatment, the **oral absorptionwas > 75%.** After a single oral dose of 10 mg/kg of *Brodifacoum* about 64.0% was absorbed and could be accounted for in the liver, carcass and bile 48h after dosing. The rest was recovered in the faeces, as unabsorbed material.

After absorption the product was widely distributed. 10 days after dosing the proportion of the retained dose was highest in the liver (22.8 %), followed by the pancreas (2.3 %), and then the kidney (0.8 %), heart (0.1 %) and spleen (0.2 %). The remainder of the dose (≅50%) was in the carcass and skin.

*Brodifacoum* was only partially metabolised. 31.3% and 19.6% of the residues in the carcass and liver, respectively, was unchanged *Brodifacoum*. Two more polar metabolites were detected in the bile, the major one being identified as the glucuronide.

*Brodifacoum* shows a high potential for bioaccumulation: in all studies undertaken and at all dose levels tested, the liver retained the largest % of the dose, even very long time after dosing.

Analyses of the rat livers from the 90 day feeding study, indicate a non-linear accumulation of *Brodifacoum* vs dose and time.

A small amount (11 – 14%) of the radioactivity was slowly eliminated in urine and faeces over 10 days following a single oral dose of 0.25 mg/kg. Biliary and renal routes are of equal significance in the elimination of *Brodifacoum*. The rate of elimination as given by the biological half-life, was calculated to be 150 – 200 days.

The elimination from the liver was biphasic at higher doses. There was a rapid phase (days 1-4) which also corresponded to a reduction in clotting factor synthesis, followed by a slower terminal phase (days 28-84) during which blood clotting function was normal. The half-life of elimination from the liver during the rapid and the slow phase was ≅4 and 128 days, respectively. At low dose levels, clotting factor synthesis was unaffected indicating that probably only the slow elimination phase was present in the liver. The half-life of *Brodifacoum* in the liver was calculated in the range of 282-350 days.

Dermal absorption was assessed by using a formulation (ready-for-use pellet bait) containing 0.0048% *Brodifacoum* w/w tested in vitro test on human skin samples. Over the entire 24 h exposure *Brodifacoum* (determined by LC-MS-MS) was found below the LOQ in the receptor fluid (<3.53% of the applied dose) and in the epidermis (<1.64%), after tape stripping. The applied dose was readily removed by mild skin washing and recovered (108 ±6.25%) in the washing fluid. **A ‘surrogate value’ of 5% dermal absorption was calculated** by summing up the amount in the receptor fluid and in the epidermis after tape stripping, which can be considered as systemically available material. This value has been taken forward to the risk characterization as the worst case, also taking into account that the exposure period exceeds the usual time (*i.e.* 8 hours) of professional handling.

***Data from Activa/PelGar*:**

Read across to data from some related 2nd generation anticoagulants (*i.e.* *Difenacoum*, *Flocoumafen*) is requested for ADME data, including dermal absorption, and has been applied for other end-points by the RMS.

Beside the similar mode of action, the read across is supported by bridging studies demonstrating the similarity in physico-chemical and toxicological properties of these substances which are presented up-front to Doc. IIA- Section 3.

Anticoagulant rodenticides including *Brodifacoum* are rapidly absorbed via the gastro-intestinal tract and oral absorption is assumed to be 100%, on the basis of amount of radioactivity recovered in the excreta and retained in the tissues. The major route of elimination after oral administration is via the faeces, both as polar metabolites and parent compound. *Brodifacoum* is widely distributed and bioaccumulates in the liver with minor concentrations in the kidney.

Elimination processes are very slow with 50-75% of the administered dose being retained in the liver (t1/2 for hepatic residues more than 200 days).

The metabolism of *Brodifacoum* is limited, although in repeated dose studies evidence of induction of metabolism was reported, with increasing levels of radioactivity associated to polar metabolites recovered in the urine. The toxicologically relevant chemical species is the parent compound.

No study on dermal absorption of *Brodifacoum* has been presented. *Brodifacoum* is expected to be slowly absorbed through the skin, due to the lipophylicity of the molecule, allowing passive transport through the membrane. The read across principle can be applied, based on the close structural relationship, the similar physico-chemical properties and the same mode of action displayed by *Brodifacoum* towards other 2nd generation anticoagulants, such as *Difethialone* and *Difenacoum*. A dermal absorption value =4% has been adopted for *Difethialone*, whereas in the case of *Difenacoum* twodifferent values have been used for risk characterisation depending on the type of formulation, that is 3% (pellets and grains) or 0.047% (wax block bait).

In the CAR, by applying the read across from data on a structurally related 2nd generation anticoagulant *Difenacoum*, a 3% dermal absorption value was adopted for the exposure calculation. This value was calculated from a dermal absorption study testing a pellet formulation containing *Difenacoum* as active substance.

***Conclusion on toxicokinetics:***

An almost complete oral absorption can be considered, on the basis of amount of radioactivity recovered in the excreta and retained in the tissues. *Brodifacoum* is widely distributed and bioaccumulates mainly in the liver with lower concentrations in the kidney. Hepatic bioaccumulation of *Brodifacoum* is a non-linear *vs* dose and time. The elimination kinetic from the liver was biphasic, with an half-life in the range of 282-350 days. The excretion after oral administration is very slow (11 – 14% in 10 days), occurring via the urine and the bile, both as polar metabolites (glucuronide) and parent compound. The metabolism of *Brodifacoum* is limited and the toxicologically relevant chemical species is the parent compound.

Concerning the dermal absorption value to be used in the risk characterisation for wax block bait, in the Combined Assessment Report for *Difenacoum* (September 2009) a value of 0.047% was proposed. Therefore, on the basis of the available study and reading across from data on other 2nd generation anticoagulant rodenticides, two different values should be used for risk characterisation depending on the type of formulation: 5% (pellets and grains) or 0.047% (wax block bait).

* **Acute effects**

***Data from Syngenta:***

*Brodifacoum* was very toxic to rats and mice with similar oral LD50 of about 0.4 mg/kg bw to the male rat and mouse. *Brodifacoum* is also acutely toxic by the dermal and inhalation routes. Death was the result of internal haemorrhage.

*Brodifacoum* does not fulfil the EU criteria for classification as a skin or eye irritant, but is able to cause skin sensitization in guinea pig and fulfils the EU criteria for classification as a skin sensitizer.

***Data from Activa/PelGar*:**

*Brodifacoum* is very toxic if swallow (oral LD50 <5 mg/kg bw) or in contact with skin (dermal LD50= 7.48 mg/kg bw in rat females; even lower in males).

The waiving for the inhalation toxicity study has been accepted due to low vapour pressure of *Brodifacoum* and data on dustiness and particle size, indicating that the potential for inhalation is limited in addition to ethical and animal welfare reasons. However, based on data with structurally related compounds with the same mechanism of action (*i.e.* 2nd generation anticoagulants), it is expected that the substance is also highly toxic after inhalation.

*Brodifacoum* is not irritant to the skin or eyes of rabbits and showed no sensitizing potential in a LLNA study in mice.

***Conclusion on acute effects:***

*Brodifacoum* is very toxic after oral administration and also via the dermal and inhalation routes. Death was the result of internal haemorrhage. Classification with T+; R26/27/28; ‘Very toxic by inhalation, in contact with skin and if swallowed’ is warranted.

*Brodifacoum* does not fulfil the EU criteria for classification as a skin or eye irritant. Although showed no sensitizing potential in a LLNA study in mice, it was able to cause skin sensitization in guinea pig and fulfils the EU criteria for classification as a skin sensitizer.

* + - * **Repeated Dose Effects**

***Data from Syngenta:***

Repeated dose oral studies show that in the rat and in the dog, the clinical signs, haematological and post mortem data were consistent with the known pharmacological action of *Brodifacoum*: impairment of the clotting cascade and increased prevalence of haemorrhage leading to death. There were no indications of other secondary toxicities: any of the other parameters including histopathological analysis revealed no treatment related alterations.

The subchronic 90-day oral toxicity allowed the derivation of the lowest repeated toxicity NOEL= 0.001 mg/kg bw/day. In this study, no treatment related effects on haematological parameters were evidenced at any dose, after 45 days, but statistically significant increases in both the kaolin-cephalin time (KCT) and the prothrombin time (PT) were measured at the highest dose level, 0.004 mg/kg bw/day after 90 days. Based upon this effect on prothrombin times and based on haemorrhagic changes seen at necropsy, the NOEL was set at the next lowest dose, 0.001 mg/kg bw/day.

Classification with T; R48/23/24/25 “Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed” is warranted based on these data plus extrapolation from the acute data for the dermal and inhalation route of exposure.

***Data from Activa/PelGar*:**

Repeated oral exposure to *Brodifacoum* resulted in clinical signs and toxicity consistent with the mode of action of the rodenticide and its properties of anti-coagulant agent (lethal haemorrhages). The overall NOAEL for subchronic oral toxicity is 0.04 mg/kg/day.

No data have been submitted on dermal repeated toxicity On the basis of both physico-chemical properties and *Brodifacoum* mode of action it can be anticipated that subchronic effect due to prolonged skin contact should not be disregarded.

No data on repeated inhalation toxicity have been submitted. As indicated by the low vapour pressure, dustiness and particle size, the potential for inhalation is low and the request for a repeated dose inhalation toxicity study is not considered justified also based on ethical and animal welfare reasons.

However, based on the results of the acute dermal and inhalation toxicity studies, route-to-route extrapolation, consistently with the decision adopted for *Difenacoum* (being the read across accepted for other end-points), it is justified to assume a similar concern for serious damage to health by prolonged exposure through dermal and inhalation routes also.

* + - * **Genotoxicity**

***Data from Syngenta:***

*Brodifacoum* was tested in *Salmonella typhimurium* strains TA 1535, TA 1537,TA 98, TA 100, TA 1538. with and without S9-mix, up to 5000 mg/plate, with negative results. No clastogenic activity was observed in the *in-vitro* cytogenetic assay in human lymphocytes, performed with and without metabolic activation, up to cytotoxic doses. The *in vitro* mammalian cell mutation assay in mouse lymphoma L5178Y cells also resulted negative, with and without S9-mix, while cytotoxic effects was observed at the highest doses. The AS applicant submitted also an *in vitro* UDS test and in an *in vitro* cell transformation assay, but because of several methodological and reporting shortcomings, they were considered of limited scientific significance. An *in vivo* mouse micronucleus test gave negative results. The studies submitted were rather dated, therefore they were not always compliant with the current guidelines. However a genotoxic potential of the active substance can be reliably ruled out.

***Data from Activa/PelGar*:**

*Brodifacoum* was tested for genotoxic activity in the bacterial reverse mutation test in *Salmonella thyphimurium* in strains TA 98, TA 100, TA 102, TA 1535 and TA 1537, up to 5000 g/plate, with and without metabolic activation (S9-mix). No genotoxic activity was observed in any bacterial strain. The substance resulted negative up to cytotoxic concentration also in the gene mutations assay in L5178Y mouse lymphoma cells, with and without S9-mix, and in the *in vitro* mammalian chromosome aberration test in human lymphocytes (50% mitotic inhibition at the maximum dosage tested).

* + - * **Carcinogenicity/chronic toxicity**

Carcinogenicity and long-term toxicity studies were waived as infeasible and unnecessary.

* + - * **Reproductive and developmental toxicity**

***Data from Syngenta:***

*Brodifacoum* did not induce developmental effects in two adequate prenatal toxicity studies

in the rat and rabbit, respectively.

In particular, in the rat studies maternal hemorrhages were observed at dose levels > 0.01 mg/kg bw (NOEL 0.001 mg/kg bw) whereas no effects on conceptuses were detected up to the top dose level of 0.02 mg/kg bw. In the rabbit study, the top dose of 0.005 mg/kg b.w caused a high proportion of maternal deaths, whereas no significant effects on litters were observed. In spite of these findings, a provisional decision has been made at the Technical Meeting of Classification and Labelling that [R61] should be applied to all anticoagulant active substances on the basis of analogy to *Warfarin*.

***Data from Activa/PelGar*:**

There was no evidence of developmental toxicity effects up to the dose levels of 0.04 and 0.004 mg/kg bw in rats and rabbits, respectively. In rabbit dams an increase in kaolin-cephalin and prothrombin time was present at 0.004 mg/kg bw (NOAEL 0.002 mg/kg).

Whereas it is suggested that two-generation studies may not be need for anticoagulant rodenticides, a two-generation study on rat was submitted: findings confirmed those of developmental toxicity, both qualitatively (parental toxicity with haemorrhages, no reproductive or developmentakl effects in the absence of general toxicity) and quantitatively (NOAEL: 0.001 mg/kg bw).

Since the conventional OECD Guideline 414 may have limitations in the detection of possible developmental effects of coumarin related compounds, and in spite of these findings, a provisional decision has been made at the Technical Meeting of Classification and Labelling that [R61] should be applied to all anticoagulant active substances on the basis of analogy to *Warfarin.*

* + - * **Neurotoxicity**

***Data from Syngenta:***

None of the acute or subchronic performed tests gave any indication for a potential neurotoxic effect of *Brodifacoum*

***Data from Activa/PelGar*:**

The toxicological studies do not indicate any neurotoxic effects.

***Conclusion on repeated dose effects:***

Repeated oral exposure to *Brodifacoum* resulted in clinical signs and toxicity consistent with the mode of action of the rodenticide and its properties of anti-coagulant agent (lethal haemorrhages). The NOEL for subchronic oral toxicity is in the range 0.04 -0.001 mg/kg/day (the lowest values identified with sensitive end-points, such as increases in both the kaolin-cephalin time and the prothrombin time). Based on results from the acute dermal and inhalation toxicity studies, route-to-route extrapolation, consistently with the decision adopted for *Difenacoum*, it is justified to assume serious damages associated to prolonged exposure through dermal and inhalation routes also. Therefore, classification with T; R48/23/24/25 “Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed” is warranted.

***Conclusion on Genotoxicity and Carcinogenicity:***

*Brodifacoum* displayed no mutagenic activity in a standard range of genotoxicity tests. No long-term carcinogenicity study was submitted by the two AS applicants. In fact, chronic toxicity studies were not considered to be technically feasible due to the specific action of the active substance on the test/target species. However, the anticoagulant action is apparently the only pharmacological action of *Brodifacoum*. The active substance has no structural alerts for carcinogenicity and no concern about possible non-genotoxic carcinogenic potential can be derived from the toxicological studies. Therefore the justifications of both AS applicants for not-submission of carcinogenicity data was considered acceptable.

***Conclusion on Reproductive toxicity:***

Reproductive and developmental toxicity studies on *Brodifacoum* did not reveal any specific effects. General toxicity effects were consistent with the mode of action of the rodenticide and its properties of anti-coagulant agent. The lowest NOAELs for rabbits and rats were 0.002 and 0.001 mg/kg bw.

In spite of these findings, a provisional decision has been made at the Technical Meeting of Classification and Labelling that [R61] should be applied to all anticoagulant active substances on the basis of analogy to *Warfarin*.

None of the acute or subchronic performed tests gave any indication for a potential neurotoxic effect of *Brodifacoum*.

The harmonised classification of the active substance is the following:

|  |  |
| --- | --- |
| **Classification under directive 67/548/EEC** | **Classification under regulation (EC) 1272/2008** |
| T+ R27/28  T ; R48/24/25  No specific limit concentrations. | Acute Tox 1 H310  Acute Tox 2 H300  STOT RE Cat 1 H372  No specific limit concentrations. |

|  |
| --- |
| * **Major change application for FANGA PATE 25 2018** |
| The harmonised classification of the active substance is the following:   |  |  |  | | --- | --- | --- | | **Classification - Regulation (EC) 1272/2008** | | | | Hazard category | Acute Tox. 1 | | | STOT RE 1 | | | Repr.1A | | | Aquatic Acute 1 | | | Aquatic Chronic 1 | | | Hazard statements | H310 | Fatal in contact with skin. | | H300 | Fatal if swallowed. | | H330 | Fatal if inhaled | | H372 | Causes damage to organs (blood) through prolonged or repeated exposure. | | H360D | May damage the unborn child | | H400 | Very toxic to aquatic life. M-factor = 10 | | H410 | Very toxic to aquatic life with long lasting effects. M-factor = 10 | | Specific Concentration Limits | Repr. 1A; H360D: C ≥ 0,003 %  STOT RE 1; H372: C ≥ 0,02 % STOT RE 2; H373: 0,002 % ≤ C < 0,02 % | |   The following corresponds to the summary of the derivation of the AELs from the combined Assessment Report of brodifacoum:  ***Data from Syngenta:***  The Acceptable Exposure Level for acute exposure (AELacute) was based on the maternal NOEL from developmental study of 0.001 mg/kg bw/day (rat, maternal effect). A safety factor of 300 (10 for intra-species variability x 10 for inter-species variability x 3 additional factor for severity of effects). The AELacute results to be of 3.3 x 10-6 mg/kg/day.  The Acceptable Exposure Level for repeated exposure (AELchr) was based on a subchronic NOEL from a 90-day oral rat study of 0.001 mg/kg bw/day. A safety factor of 300 (10 for intra-species variability x 10 for inter-species variability x 3 additional factor for severity of effects). The AELchr results to be of 3.3 x 10-6  mg/kg/day.  ***Data from Activa/PelGar*:**  The Acceptable Exposure Level for acute exposure (AELacute) was based on NOAEL from a developmental study (female rabbit) of 0.002 mg/kg bw/day. A safety factor of 300 (10 for intra-species variability x 10 for inter-species variability x 3 additional factor for severity of effects). The AELacute results to be of 6.7 x 10-6  mg/kg bw/d.  The Acceptable Exposure Level for repeated exposure (AELchr) was based on NOAEL for females from the reproductive 2-generation study in rat of 0.001 mg/kg bw/day. A safety factor of 300 (10 for intra-species variability x 10 for inter-species variability x 3 additional factor for severity of effects). The AELchr results to be of 3.3 x 10-6  mg/kg bw/day.  TMIII09 agreed to derive AELmedium term consistently with what decided for the other AVK rodenticides. Therefore, AELmedium term was calculated from the NOAEL of 0.002 mg/kg bw/day (developmental oral toxicity study in rabbit) divided by an Assessment Factor of 300 (10 for interspecies x 10 for intraspecies x 3 additional factor for severity of effects). The AELmedium term results to be of 6.7 x 10-6 mg/kg bw/day.  ***Conclusions****:*  The following AELs should be considered in the risk characterization for *Brodifacoum*:   * AELacute of 3.3 x 10-6 mg/kg/day based on the maternal NOEL from a teratogenicity study of 0.001 mg/kg bw/day (rat, maternal effect) * AELmedium term of 6.7 x 10-6 mg/kg bw/day based on the NOAEL from a developmental study (female rabbit) of 0.002 mg/kg bw/day * AELchr of 3.3 x 10-6 mg/kg bw/day based on the NOAEL for females from the reproductive 2-generation study in rat of 0.001 mg/kg bw/day |

#### Toxicology of the substance(s) of concern

Considering the following definition of a substance of concern set in the tTNsG on data requirement chapter 4 (2000), “*the substance is regarded as a substance of concern if [...] it is classified as dangerous and its concentration in the product exceeds the classification limit set in the Council Directive 88/379/EEC, as amended by Directive 1999/45/EC, for a particular dangerous property or the other classification limit indicated for the substance in a preparation set in Annex I of Council Directive 67/548/EEC or causes that the overall sum of the concentrations of dangerous substances in the product exceeds the limit for classification of the preparation set in Council Directive 88/379/EEC, as amended by Directive 1999/45/EC, for a particular dangerous property*”, the biocidal product FANGA PATE PRO contains no substance of concern.

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| Considering the definition of a substance of concern set in the Guidance on the BPR Volume III Humana Health – Part B Risk Assessment, FANGA PATE 25 does not contain any substance of concern. |

|  |
| --- |
| * **Renewal application for FANGA PATE 25 – 2019** |
| Considering the definition of a substance of concern set in the Guidance on the BPR Volume III Humana Health – Part B Risk Assessment, FANGA PATE 25 does not contain any substance of concern. The active substance Bronopol is currently under evaluation. |

#### Toxicology of the biocidal product

The toxicology of the biocidal product was examined appropriately according to standard requirements. The product was a dummy product in the EU- review program for inclusion of the active substance in Annex I of Directive 98/8/EC.

The basis for the health assessment of the biocidal product is laid out in Annex 5 ”Toxicology – biocidal product”.

Acute oral and dermal toxicity, skin and eye irritation and skin sensitisation studies have been performed with the product FANGA BLOC SP PRO, a block formulation containing 0.005% of brodifacoum. The compositions of FANGA BLOC SP PRO and FANGA PATE PRO are considered similar.

|  |
| --- |
| * **Major change application for FANGA 25 – 2018** |
| Except the content of a.s and some decrease of coformulants that do not impact the toxicity of the formulation, FANGA PATE 25 is considered similar to FANGA PATE PRO. Therefore, the results obtained with FANGA BLOC SP PRO in toxicology studies can be extrapolated to FANGA PATE 25, and considered as a worst-case. |

|  |
| --- |
| * Renewal application for FANGA PATE 25 - 2019 |
| No change is necessary. |

##### Percutaneous absorption

A default value of 0.047% was considered for FANGA PATE PRO, as mentioned in the brodifacoum assessment report.

|  |
| --- |
| * **Major change application for FANGA PATE 25 – 2018** |
| No new data on dermal absorption has been submitted.  A dermal absorption value of 0.047 %, based on an in vitro study presented in the CAR of the a.s and carried out with a product containing 0.005% a.s (50 ppm) has been retained. No difference in dermal absorption is expected at these very low concentrations, therefore this value is applied to FANGA PATE 25. |

|  |
| --- |
| * Renewal application for FANGA PATE 25 – 2019 |
| No new dermal absorption study has been submitted for the renewal of the product. Thus, a dermal absorption value of 0.047% is considered for brodifacoum. |

##### Acute toxicity

*Oral route*

No mortality occurred during the study (daily examination during 14 days).

No clinical signs related to the administration of the test item were observed.

The body weight evolution of the animals remained normal throughout the study.

The macroscopically examination of the animals at the end of the study did not reveal treatment-related changes.

LD50 of the test item is higher than 2000 mg/kg/bw.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Route** | **Method** | **Species** | **Dose level** | **LD50** |
| Oral | OECD 423 | Rat 3 males and 3 females | 2000mg/kg bw | >2000 mg/kg bw |

*Dermal route*

No mortality occurred during the study.

The body weight evolution of the animals remained normal throughout the study.

Neither cutaneous reactions nor systemic clinical signs related to the administration of the test item were observed.

The macroscopically examination of the animals at the end of the study did not reveal treatment-related changes.

LD50 of the test item is higher than 2000 mg/kg/bw.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Route** | **Method** | **Species** | **Dose level** | **LD50** |
| Dermal | OCDE 402 | Rat 5 males and 5 females | 2000 mg/kg bw | >2000 mg/kg bw |

Based on the above-mentioned results, no classification is required for FANGA PATE PRO.

##### Irritation and corrosivity

Based on the results of the irritation assays on rabbit’s skin and eye, no classification is required for FANGA PATE PRO.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Route** | **Method** | **Species** | **Dose level** |  |
| Skin | OECD 404 | Rabbit NZ  3 females | 0.5 g | Not irritant |
| Eye | OCDE 405 | Rabbit NZ  3 females | 0.1 g | Not irritant |

##### Sensitisation

Based on the results of the irritation assays on rabbit’s skin and eye (LLNA), no classification is required for FANGA PATE PRO.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Route** | **Method** | **Species** | **Dose level** |  |
| Skin | OECD 429 | Mice16 (12 for the treated groups) | Topical way of induction:  5, 10, 25% of the test item | Not skin sensitizing |

##### Other studies

No other studies are performed on FANGA PATE PRO.

### Human exposure assessment

FANGA PATE PRO (PT14) is a ready-to-use rodenticide containing 0.005 % of brodifacoum (pure: 950 g/kg). Baits are packaged in sachet for professional users.The baits are placed in bait stations (tamper-resistant bait boxes or covered bait stations) out of reach of children and domestic animals.

No new human exposure studies have been submitted.

#### Identification of main paths of human exposure towards active substance from its use in biocidal product

The potential for exposure to brodifacoum paste baits is summarised in the table below:

Table 4: Main paths of human exposure

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Exposure path** | **Industrial use** | **Professional use** | **General public** | ***via* the environment** |
| Inhalation | Not relevant | Potentially significant | Negligible | Negligible |
| Dermal | Not relevant | Potentially significant | Potentially significant | Negligible |
| Oral | Not relevant | Negligible | Potentially significan | Negligible |

#### Direct exposure as a result of use of the active substance in biocidal product

##### Exposure of professional users

*In Annex 6 „Safety for professional operators“, the results of the exposure calculations for the active substance and the substance of concern for the professional user are laid out.*

FANGA PATE PRO is used for the control of rats and mice for use indoors, with the purpose of protecting human food and animal feedstuffs, and for human hygiene.

The product is only supplied in sachets. Considering the nature of the sachets (paper), a dermal exposure during loading is taken into account. Exposure assessment has been performed with the dose of 180 g of product for the control of rats. This assessment covers the assessment for mice as the intended doses are lower.

In the dossier, TRIPLAN assessed the human exposure based on the TNsG on human exposure, section 7.2 of part 3 – June 2002. This document only contains a series of examples for human exposure assessment and should not be considered as reference data. Therefore, since TRIPLAN provided a letter of access for the unpublished CEFIC study “*Chambers J.G. and Snowdon P.J. Study to determine potential exposure to operators during simulated use of anticoagulant rodenticide baits*”, the FR CA decided to base the human exposure assessment for professionals on this study as done by the RMS (Italy) of the active substance in the Assessment report on brodifacoum. This study examined the inhalation and dermal exposures associated with all activities involved in using a paste bait (filling and placing bait points, and clean-up and disposal of bait points). The used paste bait containing flocoumafen was selected as a worst case representative product of all block rodenticide baits. In this study, 10 replicates were performed at 1, 5 and 10 manipulations. Therefore, the FR CA decided to use the exposure estimations issued from the CEFIC study for the assessment of FANGA PATE PRO

Additionally, the HEEG opinion on harmonising the number of manipulations in the assessment of rodenticides (anticoagulant), agreed at TMIII 2010 and the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011 were taken into account for the estimation of exposure for professionals.

Loading phase:

Based on the CEFIC study and taking into account the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011, the amount of product on fingers/hands **during the loading** of 5 wax blocks of 20g per manipulation was 27.79 mg of product. The following parameters were taken into account:

* active substance in product: 0.005 %,(w/w);
* number of blocks per bait site[[17]](#footnote-18): 18 for control of rats
* dermal absorption: 0.047 %,
* body weight: 60 kg.

Thus, the systemic dose of brodifacoum per placing of one bait site is 3.9x10-8 mg/kg bw/event for control of rats and mice.

The harmonised number of manipulations for rodenticides anticoagulant set in the HEEG opinion agreed at TMIII 2010 was used to assess the overall exposure systemic dose. Considering 60 loadings are done per day, the systemic dose via skin is 2.4x10-6 mg a.s/kg bw/day for the control of rats.

Cleaning phase:

Based on the CEFIC study and taking into account the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011, the amount of product on fingers/hands **during the cleaning** of one bait site is 5.70 mg of product. The following parameters were taken into account:

* active substance in product: 0.005 %,(w/w);
* dermal absorption: 0.047 %,
* body weight: 60 kg.

Thus, the systemic dose of brodifacoum per cleaning of one bait site is 2.2x10-9 mg/kg bw/event for control of rats and mice (because the amount of disposed bait is not taken into account).

The harmonised number of manipulations for rodenticides anticoagulant set in the HEEG opinion agreed at TMIII 2010 was used to assess the overall exposure systemic dose. Considering 15 cleaning are done per day, the systemic dose via skin is 3.4x10-8 mg a.s/kg bw/day for the control of rats and mice, because the amount of disposed bait is not taken into account during cleaning.

**In conclusion, the total systemic dermal exposure is set at 2.4x10-6 mg/kg bw/day without PPE for the control of rats and mice.**

##### Exposure of non-professional users

*The product is for professional use only.*

#### Indirect exposure as a result of use of the active substance in biocidal product

***Handling of dead rodents (adult, child, infant) – acute scenario***

Exposure can occur during handling of dead rodents by professionnal and general public. However, this scenario is excluded and considered of low relevance due to unrealistic assumptions (TNsG on human exposure (2007)). Gloves are recommended to help prevent rodent-borne disease, therefore exposure due to this senario is considered negligible.

***Oral exposure by ingesting bait (infant) – acute scenario***

Besides, exposure of non users can occur during ingestion of poison baits. For the scenario “*oral exposure by ingesting bait*”, a reverse scenario was calculated. Based on the acute AEL of 3.3 x 10-6 mg a.s/kg bw/day, a body weight of 10 kg and an oral absorption of 75% (as stated in the Assessment report of brodifacoum), ingestion of more than 0.88 mg of product per day by an infant is needed to exceed the AEL.

#### Exposure to residues in food

The intended uses description of the product FANGA PATE PRO indicates that these uses are not relevant in terms of residues in food and feed. The product is to be used as rodenticide and does not come in direct or indirect contact with food and feedstuff. No further data are required concerning the residue behaviour.

#### Combined exposure

Not relevant.

### Major change application for FANGA PATE PRO – 2016

FANGA PATE PRO (PT14) is a ready-to-use rodenticide containing 0.005 % of brodifacoum (pure: 950 g/kg). Baits are packaged in sachet for professional and non-professional users.The baits are placed in bait stations (bait boxes or secured bait stations) out of reach of children and domestic animals. It is intended to be used by professional and non-professional users for control of rodent pests indoor and outdoor (in and around buildings, and open areas) and in waste dumps and landfills by professional users. FANGA PATE PRO is applied manually in bait stations by professionals and non-professional for whom the secured boxes could be pre-filled.

*.*

#### Identification of main paths of human exposure towards active substance from its use in biocidal product

The potential for exposure to brodifacoum paste baits is summarised in the table below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Exposure path** | **Industrial use** | **Professional use** | **General public** | ***via* the environment** |
| Inhalation | Not relevant | Negligible | Negligible | Negligible |
| Dermal | Not relevant | Potentially significant | Potentially significant | Negligible |
| Oral | Not relevant | Negligible | Potentially significant | Negligible |

#### Direct exposure as a result of use of the active substance in biocidal product

FANGA PATE PRO packaged in 10 and 20 g sachet is intended to be used by professional and non-professional users at the following dosage:

- 180 g/secured bait point for rats

- 30g/secured bait point for mice

Paste baits are individually packaged in sachet (paper) for professional and non-professional users.

##### Exposure of professional users

For the professional user, the initial assessment remains unchanged.

##### Exposure of non-professional users

FANGA PATE PRO is used for the control of rats and mice for indoor and outdoor uses (in and around buildings and open areas) with the purpose of protecting human food and animal feedstuffs, and for human hygiene.

The product is packaged in sachet and two application’s methods are claimed: pre-filled secured boxes and manual application of baits in bait stations. Therefore, the exposure assessment has been performed considering the manual application which covers the exposure of pre-filled secured boxes.

For rat, the number of blocks per bait site is 18 (dosage of 180g/bait point with sachet of 10 g) whereas for mice, only 3 blocks are necessary for a 30g/bait point dosage).

Therefore, the exposure assessment has been realized for the control of rats with the dose of 180 g of product and this assessment covers the evaluation for mice as the intended doses are lower.

During non-professional use, the major route of exposure is dermal. The inhalation exposure could be considered as negligible considering the low vapour pressure of brodifacoum and the physical state of the product (paste formulation).

Considering the nature of the sachet (paper), dermal exposure is expected during loading and cleaning of bait boxes.

Based on the CEFIC study and taking into account the *HEEG opinion on a harmonised approach for the assessment of rodenticides (anticoagulants)* agreed at TMII 2011, the indicative amount of product on fingers/hands **during the loading** of 5 wax blocks of 20g per one manipulation was 27.79 mg. The following parameters were taken into account:

* Active substance in product: 0.005 % (w/w);
* Number of pastes per bait site[[18]](#footnote-19): 18 (worst case assumption: 18 pastes of 10 g; 180 g/bait point);
* Dermal absorption: 0.047 %;
* Body weight: 60 kg.

Thus, the systemic dose of brodifacoum per placing of one bait site is 3.92 x 10-8 mg/kg bw/event for control of rat. Therefore, considering 5 loadings per day, the systemic dose of brodifacoum on fingers/hands during loading phase is 1.96x10-7 mg/kg bw/day without any protective equipment.

Based on the CEFIC study and taking into account the *HEEG opinion on a harmonised approach for the assessment of rodenticides (anticoagulants)* agreed at TMII 2011, the indicative amount of product on fingers/hands **during the cleaning** of one bait site is 5.70 mg. The following parameters were taken into account:

* Active substance in product: 0.005 % (w/w);
* Dermal absorption: 0.047 %;
* Body weight: 60 kg.

Thus, the systemic dose of brodifacoum per cleaning of one bait site is 2.23 x 10-9 mg/kg bw/event for control of rat. Therefore, considering 5 cleanings per day, the systemic dose of brodifacoum on fingers/hands during cleaning phase is 1.12x10-8 mg/kg bw/day without any protective equipment.

The harmonized number of manipulations for rodenticides anticoagulant set in the HEEG opinion agreed at TM III 2010 was used to assess the overall exposure systemic dose. Considering that 5 loadings and 5 cleaning are done per day for a non-professional user, the overall systemic dose via skin (loading + cleaning) is 2.07 x 10-7 mg a.s/kg bw/day without gloves for the control of rats.

The estimations above represent a worst case for the application of FANGA PATE PRO in prefilled stations.

*In Annex 4 “Safety for non-professional operators and the general public”, the results of the exposure calculations for the active substance and the substance of concern for the non-professional user and the general public are laid out.*

| **Tier** | **Inhalation exposure** | **Dermal exposure** | **Total exposure** |
| --- | --- | --- | --- |
| PPE | Systemic dose | Systemic dose | Systemic dose |
| mg a.i. / kg bw /day | mg a.i. / kg bw /day | mg a.i. / kg bw /day |
| ***Paper bag (exposure during loading and cleaning phases)*** | | | |
| Tier 1:  Without PPE | na | 2.07 x 10-7 | 2.07 x 10-7 |

### Major change application for FANGA PATE 25 – 2018

The major change application of FANGA PATE 25 consists in:

* a decrease of the a.s. content (50 ppm to 25 ppm);
* The addition of a user category (non professionals);
* An increase of the application rate for rats (from 180g to 200g);
* an addition of packaging sizes (with a minimal size of sachet of 5 g).

#### Direct exposure as a result of use of the active substance in biocidal product

##### Exposure of professional users

FANGA PATE 25 is used for the control of rats and mice for use indoors, with the purpose of protecting human food and animal feedstuffs, and for human hygiene.

The product is only supplied in sachets. Considering the nature of the sachets (paper), a dermal exposure during loading is taken into account. Exposure assessment has been performed with the dose of 200 g of product for the control of rats. This assessment covers the assessment for mice as the intended doses are lower.

In the dossier, TRIPLAN assessed the human exposure based on the TNsG on human exposure, section 7.2 of part 3 – June 2002. This document only contains a series of examples for human exposure assessment and should not be considered as reference data. Therefore, since TRIPLAN provided a letter of access for the unpublished CEFIC study “*Chambers J.G. and Snowdon P.J. Study to determine potential exposure to operators during simulated use of anticoagulant rodenticide baits*”, the FR CA decided to base the human exposure assessment for professionals on this study as done by the RMS (Italy) of the active substance in the Assessment report on brodifacoum. This study examined the inhalation and dermal exposures associated with all activities involved in using a paste bait (filling and placing bait points, and clean-up and disposal of bait points). The used paste bait containing flocoumafen was selected as a worst case representative product of all block rodenticide baits. In this study, 10 replicates were performed at 1, 5 and 10 manipulations. Therefore, the FR CA decided to use the exposure estimations issued from the CEFIC study for the assessment of FANGA PATE 25

Additionally, the HEEG opinion on harmonising the number of manipulations in the assessment of rodenticides (anticoagulant), agreed at TMIII 2010 and the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011 were taken into account for the estimation of exposure for professionals.

Loading phase:

Based on the CEFIC study and taking into account the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011, the amount of product on fingers/hands **during the loading** of 5 wax blocks of 20g per manipulation was 27.79 mg of product. The following parameters were taken into account:

* active substance in product: 0.0025 %,(w/w);
* number of blocks per bait site[[19]](#footnote-20): 40 for control of rats
* dermal absorption: 0.047 %,
* body weight: 60 kg.

Thus, the systemic dose of brodifacoum per placing of one bait site is 4.35 x10-8 mg/kg bw/event for control of rats and mice.

The harmonised number of manipulations for rodenticides anticoagulant set in the HEEG opinion agreed at TMIII 2010 was used to assess the overall exposure systemic dose. Considering 60 loadings are done per day, the systemic dose via skin is 2.61 x10-6 mg a.s/kg bw/day for the control of rats.

Cleaning phase:

Based on the CEFIC study and taking into account the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011, the amount of product on fingers/hands **during the cleaning** of one bait site is 5.70 mg of product. The following parameters were taken into account:

* active substance in product: 0.0025 %,(w/w);
* dermal absorption: 0.047 %,
* body weight: 60 kg.

Thus, the systemic dose of brodifacoum per cleaning of one bait site is 1.12 x10-9 mg/kg bw/event for control of rats and mice (because the amount of disposed bait is not taken into account).

The harmonised number of manipulations for rodenticides anticoagulant set in the HEEG opinion agreed at TMIII 2010 was used to assess the overall exposure systemic dose. Considering 15 cleaning are done per day, the systemic dose via skin is 1.67 x10-8 mg a.s/kg bw/day for the control of rats and mice, because the amount of disposed bait is not taken into account during cleaning.

**In conclusion, the total systemic dermal exposure is set at 2.63x10-6 mg/kg bw/day without PPE for the control of rats and mice.**

**When considering gloves with a protection factor of 95%, the total systemic dermal exposure is set at 1.31 x10-7 mg/kg bw/day for the control of rats and mice.**

##### Exposure of non-professional users

For the major change request, the use by non-pofessional users has been considred.

The product is only supplied in sachets. Considering the nature of the sachets (paper), a dermal exposure during loading is taken into account. Exposure assessment has been performed with the dose of 200 g of product for the control of rats. This assessment covers the assessment for mice as the intended doses are lower.

Loading phase:

Based on the CEFIC study and taking into account the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011, the amount of product on fingers/hands **during the loading** of 5 wax blocks of 20g per manipulation was 27.79 mg of product. The following parameters were taken into account:

* active substance in product: 0.0025 %,(w/w);
* number of blocks per bait site[[20]](#footnote-21): 40 for control of rats
* dermal absorption: 0.047 %,
* body weight: 60 kg.

Thus, the systemic dose of brodifacoum per placing of one bait site is **4.35 x10-8 mg/kg bw/event** for control of rats and mice.

The harmonised number of manipulations for rodenticides anticoagulant set in the HEEG opinion agreed at TMIII 2010 was used to assess the overall exposure systemic dose.

Considering **5 loadings** are done per day, the systemic dose via skin is **2.18 x10-7 mg a.s/kg bw/day** for the control of rats.

Cleaning phase:

Based on the CEFIC study and taking into account the HEEG opinion on an harmonised approach for the assessment of rodenticides (anticoagulants) agreed at TMII 2011, the amount of product on fingers/hands **during the cleaning** of one bait site is 5.70 mg of product. The following parameters were taken into account:

* active substance in product: 0.0025 %,(w/w);
* dermal absorption: 0.047 %,
* body weight: 60 kg.

Thus, the systemic dose of brodifacoum per cleaning of one bait site is **1.12 x10-9 mg/kg bw/event** for control of rats and mice (because the amount of disposed bait is not taken into account).

The harmonised number of manipulations for rodenticides anticoagulant set in the HEEG opinion agreed at TMIII 2010 was used to assess the overall exposure systemic dose.

Considering **5 cleanings** are done per day, the systemic dose via skin is **5.58 x10-9 mg a.s/kg bw/day** for the control of rats and mice, because the amount of disposed bait is not taken into account during cleaning.

**In conclusion, the total systemic dermal exposure is set at 2.23x10-7 mg/kg bw/day without PPE for the control of rats and mice.**

#### Indirect exposure as a result of use of the active substance in biocidal product

No modification of the scenario.

The conclusions remain unchanged.

* **Renewal application for FANGA PATE 25 – 2019**

The minor change (2018), including a reduction of use rates for rats from 200g to 100g per bait station, was not revised in human health. The reduction of use rates of 100g in paper sachet with a minimum size of 5 g leads to a number of 20 pastes to be used per day. The risk is covered by the Major change application (2017). Dermal exposure has been updated with the same parameters and 20 pastes used per day:

***Professional users***

|  |  |  |  |
| --- | --- | --- | --- |
| **Scenario** | **Dermal exposure**  **(loading phase)** | **Dermal exposure**  **(cleaning phase)** | **Total exposure** |
| Professionnal  (without PPE) | 1.31 x 10-6 | 1.67 x 10-8 | 1.32 x 10-6 |

***Non-professional users***

|  |  |  |  |
| --- | --- | --- | --- |
| **Scenario** | **Dermal exposure**  **(loading phase)** | **Dermal exposure**  **(cleaning phase)** | **Total exposure** |
| Non professionnal | 1.09 x 10-7 | 5.58 x 10-9 | 1.14 x 10-7 |

### Risk assessment for human health

The estimated exposures for the professional users are compared to the systemic AEL of brodifacoum set in the Assessment Report (3.3 x10-6 mg/kg bw/day for short-term and long-term exposures).

#### Risk for direct exposure

##### Professional users

Based on the risk assessment of the active substance, the risk for professional users resulting from

the intended use is acceptable for FANGA PATE PRO, even if gloves are not worn (%AEL at 72.3%) for the control of rats and, by extension, of mice.

Gloves are anyway recommended to help prevent rodent-borne disease. Moreover, the mention “do not open the sachet” has to be added in the label of the product.

Table 5: Summary of risk characterisation for professionals for the control of rats and mice

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **AEL**  (mg/kg bw/d) | **Exposure**  (mg/kg bw/d) | **%AEL** | **Risk** |
| **Sachet formulation (exposure during loading and cleaning phases)** | | | | |
| Professionnal (without gloves) | 3.3x10-6 | 2.4x10-6 | 72.3 | Acceptable |

##### Non-professional users

The product is for professional use only.

#### Risk for indirect exposure

Based on a reverse scenario, more than 0.88 mg of product per day should be ingested by an infant to exceed the AEL. This indicates that infants are at significant risk of poisoning. Therefore, even if FANGA PATE PRO contains a bittering agent which reduces the likelihood of ingestion, the baits should be unattainable for children.

Product label (“do not open the sachet”) and good practice advise users to prevent access to bait by children and infants.

#### Risk for consumers via residues

Considering the intended uses, no dietary risk assessment is necessary.

#### Risk for combined exposure

Not relevant.

#### Conclusion on human health risk assessment

Based on the risk assessment of the active substance, the risk for professional users resulting from the intended use is acceptable for FANGA PATE PRO for the control of rats and mice.

Risk of secondary poisoning to infants and children is considered as relevant. Therefore, even if the product FANGA PATE PRO contains a bittering agent which reduces the likelihood of ingestion, the baits should be unattainable for children. Product label (“do not open the sachet”) and good practice advise users to prevent access to bait by children and infants.

The intended uses description of the product FANGA PATE PRO indicates that these uses are not relevant in terms of residues in food and feed. The product is to be used as rodenticide and does not come in direct or indirect contact with food and feedstuff.

***Risk mitigation measures linked to risk assessment for human health***

***For professional***

* Gloves have to be worn to help prevention against rodent-borne disease.
* Do not open the sachets.
* Apply strict hygiene measures: do not eat, drink or smoke during handling of the product and wash hands after use of the product.
* Use in tamper-resistant bait boxes or in covered bait stations.
* Tamper-resistant bait boxes should be clearly marked to show that they contain rodenticides and that they should not contain other products than rodenticides.
* Covered bait stations must be placed only in areas not accessible to the general public and non-target animals.
* Baits must be unattainable to children, pets or other non-target animals in order to minimize the risk of poisoning.
* Do not place tamper-resistant bait boxes and covered bait stations on surfaces in contact with food, feed or drinks and beverages.
* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment.
* Remove all bait points after the end of treatment.

***Emergency*** *(information provided in the product Safety Data Sheet)-*

Inhalation: no action should be necessary.

Ingestion: if swallowed, seek medical advice immediately and show container or leaflet. A treatment with vitamin K1 should be necessary during a long period.

Skin or eye contact: wash immediately with plenty of water.

***Disposal considerations***

* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment.
* Remove all bait points after the end of treatment.

***Required information linked to risk assessment for human health***

None.

### Major change application for FANGA PATE PRO – 2016

#### Risk for direct exposure

*Based on the risk assessment of the active substance, a risk for professional users resulting from the intended use is unlikely. Regarding occupational safety, there are no objections against the intended use.*

##### Professional users

For the professional user, the initial assessment remains unchanged.

##### Non-professional users

The estimated exposures for the non-professional users are compared to the systemic AEL of brodifacoum set in the Assessment Report (6.7 x 10-6 mg a.s/kg bw/day).

Based on the risk assessment of the active substance, the risk for non-professional users resulting from the intended use is acceptable without any personal protective equipment during handling for FANGA PATE PRO (%AEL is set at 3%) (see Annex 7 for detailed calculations).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scénario** | **AEL (mg/kg bw/d)** | **Exposure (mg/kg bw/d)** | **%AEL** | **Risk** |
| ***Paper bag (exposure during loading and cleaning phases)*** | | | | |
| Non-professional  (without PPE) | 6.7 x10-6 | 2.07 x 10-7 | 3% | acceptable |

Not relevant

### Summary of risks characterisation of the product for human health

No unacceptable risk has been observed for non-professionals using FANGA PATE PRO in individual bags, in prefilled stations, without gloves and considering an indoor and outdoor application at the maximum recommended dose of 180 g/bait point in the control of rat. The assessment covers the evaluation for mice as the intended doses are lower (30 g/bait point).

For the professional user and the indirect scenario Infant ingesting bait, the initial conclusions remain unchanged.

Based on intended uses and proper baiting practices of the biocidal product, contamination of food/feedingstuffs is considered highly unlikely to occur. Brodifacoum baits should not be placed where food, feedingstuffs or drinking water could be contaminated

The risk mitigation measures remain unchanged for professional.

The risk mitigation measures for non- professional are followed:

* Do not open the sachets.
* Apply strict hygiene measures: do not eat, drink or smoke during handling of the product and wash hands after use of the product.
* Tamper-resistant bait boxes should be clearly marked to show that they contain rodenticides and that they should not contain other products than rodenticides.
* For non-professional users, use only in tamper-resistant boxes.
* Baits must be unattainable to children, pets or other non-target animals in order to minimize the risk of poisoning.
* Do not place tamper-resistant bait boxes and covered bait stations on surfaces in contact with food, feed or drinks and beverages.
* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment.
* Remove all bait points after the end of treatment.

### Major change application for FANGA PATE 25 – 2018

#### Risk for direct exposure

##### Professional users

Table 6: Summary of risk characterisation for professionals for the control of rats and mice

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **AEL**  (mg/kg bw/d) | **Exposure**  (mg/kg bw/d) | **%AEL** | **Risk** |
| **Sachet formulation (exposure during loading and cleaning phases)** | | | | |
| Professionnal (without gloves) | 3.3x10-6 | 2.63 x10-6 | 239 | Unacceptable |
| Professionnal (with gloves) | 3.3x10-6 | 1.31 x10-7 | 12 | Acceptable |

##### Non-professional users

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **AEL**  (mg/kg bw/d) | **Exposure**  (mg/kg bw/d) | **%AEL** | **Risk** |
| **Sachet formulation (exposure during loading and cleaning phases)** | | | | |
| Non professionnal (without PPE) | 3.3x10-6 | 2.23 x10-7 | 20 | Acceptable |

#### Risk for indirect exposure

The conclusions remain unchanged.

|  |
| --- |
| * **Renewal application for FANGA PATE 25 – 2019** |
| No change is necessary for secondary exposure. The following sentences are still proposed:  Product label (“do not open the sachets”) and good practice advise users to prevent access to bait by children and infants. |

#### Conclusion on human health risk assessment – Major change application 2018

Based on the risk assessment of the active substance, the risk for professional (with gloves) and non-professional users resulting from the intended use is acceptable for FANGA PATE 25 for the control of rats and mice.

Risk of secondary poisoning to infants and children is considered as relevant. Therefore, even if the product FANGA PATE 25 contains a bittering agent which reduces the likelihood of ingestion, the baits should be unattainable for children. Product label (“do not open the sachet”) and good practice advise users to prevent access to bait by children and infants.

* **Renewal application for FANGA PATE 25 – 2019**

The minor change (2018), including a reduction of use rates for rats from 200g to 100g per bait station, was not revised in human health. The reduction of use rates of 100g in paper sachet with a minimumsize of 5 g leads to a number of 20 pastes to be used per day. The risk is covered by the Major change application (2017):

***Professional users***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **AEL**  (mg/kg bw/d) | **Exposure**  (mg/kg bw/d) | **%AEL** | **Risk** |
| **Sachet formulation (exposure during loading and cleaning phases)** | | | | |
| Professionnal  (without gloves) | 3.3 x 10-6 | 1.32 x 10-6 | 40 | Acceptable |
| Professionnal  (with gloves) | 3.3 x 10-6 | 6.61 x 10-8 | 2 | Acceptable |

***Non-professional users***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Scenario** | **AEL**  (mg/kg bw/d) | **Exposure**  (mg/kg bw/d) | **%AEL** | **Risk** |
| **Sachet formulation (exposure during loading and cleaning phases)** | | | | |
| Non professionnal (without PPE) | 6.7 x 10-6 | 1.14 x 10-7 | 2 | Acceptable |

The risk is acceptable without PPE. Gloves are anyway recommended to help prevent rodent-borne disease. Therefore, the conclusions remain unchanged.

## Risk assessment for the environment

### Fate and distribution in the environment of the active substance brodifacoum

The summary of information about the active substance brodifacoum is carried out with the data from the combined AR of brodifacoum owned by Syngenta Limited and Activa / Pelgar Brodifacoum and Difenacoum Task Force17.

#### Degradation

##### Abiotic degradation

###### Hydrolysis in function of pH

Brodifacoum is considered stable to hydrolysis. It was concluded that the hydrolytic half-life (DT50) was above one year at environmentally relevant pH. The hydrolytic degradation is deemed negligible.

###### Photolysis in water

Brodifacoum photolytically degrades in aqueous solution with a half-life (DT50) < 1 day. Photolysis of brodifacoum was fast with 38 % of removal in the first hour of exposure. Greater than 89 % of photolysis has occurred by around three hours. No degradation products were detected.

###### Photolysis in soil

Not relevant for a use inside buildings of products containing Brodifacoum.

###### Photodegradation in air

The photo-oxidative degradation of brodifacoum in air was estimated by a structural activity relationship (QSAR) method using the Atmospheric Oxidation Program v1.90 (AOPWIN). Brodifacoum is predicted to undergo rapid indirect photolysis with OH radicals and ozone (DT50= approximately 2 hours). According to TGD the half-live has been recalculated considering COH = 0.5 \* 106 molec/cm3; corresponding to a DT50 of 0.217 days). There are no predicted effects on the atmosphere.

##### Biotic degradation

###### Aquatic compartment

* Ready biodegradation / inherent biodegradation

Brodifacoum is not readily biodegradable under OECD 301B Test (0% after 28 days). Brodifacoum is not inherently biodegradable under the conditions of the ‘Inherent – Concawe Test’ (OECD 302D) performed (0% after 56 days).

* Degradation in water/sediment system

No study on water/sediment system of the active substance has been submitted in the combined AR of brodifacoum.

Moreover it is not relevant for a use inside buildings of products containing brodifacoum.

###### Degradation in STP

No study on water/sediment system of the active substance has been submitted in the combined AR of brodifacoum.

Moreover it is not relevant for a use inside buildings of products containing brodifacoum.

###### Terrestrial compartment

Brodifacoum is persistent in soil with a DT50 value of 157 days (The Pesticide Manual 13th Edition).

Moreover it is not relevant for a use inside buildings of products containing brodifacoum.

#### Distribution

Based on literature data, the Koc value (50 000 L/kg, The Pesticide Manual 13th Edition) indicates that the active substance would not be mobile in soil and is not expected to contaminate groundwater. A laboratory study carried out by another applicant show that with Koc values which ranged from 17.8 (pH 8.46) to 426 579 (pH 3.29) with a Koc value of 9155 L/kg at pH7.1-7.6, brodifacoumcan be considered immobile in soil. Under basic conditions (high pH), Brodifacoumis not likely to be adsorbed onto soils or sewage sludge due to the ionisation of the molecule; whereas under acidic conditions (low pH), Brodifacoumis likely to be adsorbed onto soils or sewage sludge as the molecule is in its neutral or non-ionised form.

Brodifacoum is not expected to move from soil into water.

#### Accumulation

Brodifacoum has a log Kow > 6 (6.12) and is highly adsorptive; consequently these properties indicate that brodifacoum is likely to bioaccumulate in aquatic or terrestrial species.

The aquatic BCF has been estimated with calculation method for substances with a Kow > 6:

**BCFfish = 35 645 L/kg**(according to Equation 75; TGD).

The terrestrial BCF has been estimated with calculation method:

**BCFearthworm = 15 820 L/kg**(according to Equation 82d; TGD).

These BCF values confirm the high bioaccumulation of Brodifacoum in aquatic and terrestrial species.

#### Behaviour in air

The vapour pressure of brodifacoum has been determined to be << 1 x 10-6 Pa (OECD 104, EC methods A.4). Furthermore, Henry’s law constant for brodifacoum has been calculated to be << 2.18 x 10-3 Pa.m3.mol-1 at pH 7 (based on a water solubility of 0.24 mg/L). Based on these data brodifacoum is not expected to partition into atmosphere to a relevant extent.

In addition, brodifacoum is predicted to undergo rapid indirect photolysis with OH radicals and ozone (DT50= approximately 2 hours) and undergoes rapid direct photodegradation (DT50 = 0.217 days).

### Effects on environmental organisms for active substance brodifacoum

The summary of information about the active substance brodifacoum is carried out with the data from the combined AR of brodifacoum owned by Syngenta Limited and Activa / Pelgar Brodifacoum and Difenacoum Task Force.

#### Aquatic compartment (including water, sediment and STP)

##### Aquatic organisms

Based on the results of acute toxicity studies submitted in the combined AR by Activa / PelGar Brodifacoum and Difenacoum Task Force, brodifacoum is very acute toxic to aquatic organisms. No long-term tests have been performed. One study was performed on each of the two trophic levels (daphnia and algae) and two studies were performed on fish. *Selenastrum capricornutum* is the most sensitive species with a 72h ErC50 of 0.04 mg a.s./L.

Table 7: Toxicity to freshwater aquatic organisms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Guideline / Test method** | **Species** | **Endpoint** | **Results(mg a.s./L)** | **Reference** |
| OECD 203 | *Oncorhynchus mykiss -* fish | LC50 – 96h | 0.042 | Activa / PelGar Brodifacoum and Difenacoum Task Force  CAR a.s.  Doc III‑A 7.4.1.1 |
| OECD 202 | *Daphnia magna -* invertebrate | EC50 – 48h | 0.25 | Activa / PelGar Brodifacoum and Difenacoum Task Force  CAR a.s.  Doc III‑A 7.4.1.2 |
| OECD 201 | *Selenastrum capricornutum* - algae | EbC50 – 72h  ErC50 – 72h | 0.016  0.04 | Activa / PelGar Brodifacoum and Difenacoum Task Force  CAR a.s.  Doc III‑A 7.4.1.3 |

All Concentrations are expressed on measured concentrations.

Justification of PNECwater:

According to the TGD, the PNECwater is derived from the 72h ErC50 value (0.04 mg a.s./L) for *Selenastrum capricornutum* divided by an assessment factor of 1000. Therefore,

**PNECwater = 0.04 µg a.s./L.**

##### Sediment dwelling organisms

No experimental data are available for sediment dwelling organisms. A PNECsediment (0.043 mg/kgwwt) is derived through the Equilibrium Partitioning Method. However, due to the absence of measured data for the determination of a PECsediment and according to the TGD a quantitative risk characterization cannot be carried out. Therefore the risk for the sediment compartment will be covered by the risk for the aquatic compartment.

According to the TGD and considering the log Kow > 5, the PEC/PNEC ratio for the aquatic compartment is increased by a factor of 10 to take into account the possible additional uptake via sediment ingestion.

##### STP micro-organisms

The toxicity to microorganisms in a sewage treatment plant (STP) was estimated by a respiration inhibition test (OECD 209) submitted by Activa / PelGar Brodifacoum and Difenacoum Task Force . No effects of Brodifacoum on aerobic biological sewage treatment processes was expected. Due to the lack of measured values of test substance concentration, the EC10 was conservatively set greater than Brodifacoum’ water solubility (0.058 mg a.s/L).

Table 8: Toxicity to STP microorganisms

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Guideline/Test method** | **Species / Inoculums** | **Endpoint / Type of test** | **Duration** | **Results [mg a.s/L]** | | | | **Reference** |
| **EC10** | **EC20** | **EC50** | **EC80** |
| OECD 209 | Activated sludge | Respiration Inhibition | 3h | > 0.058\* | | | | Activa / PelGar Brodifacoum and Difenacoum Task Force  CAR a.s.  Doc III‑A 7.1.4 |

\* corresponding to the water solubility at pH=7 and T=20°C

Justification of PNECmicororganisms:

According to TGD (2003) when an EC10 from a respiration inhibition test is used an assessment factor of 10 should be applied.

PNECSTP microorganisms > 0.0058 mg a.s/L

Additional endpoints:

According to the combined AR of brodifacoum owned by Syngenta Limited and Activa / Pelgar Brodifacoum and Difenacoum Task Force, a lower PNEC value for sewage treatment microorganisms is provided: **PNEC STP microorganisms > 0.0038 mg a.s/L**. Therefore, as the data set are considered equivalent, the worst case PNEC from the combined AR is used in the risk assessment.

#### Atmosphere

Brodifacoum has a low volatility and is not intended to be sprayed or fumigated. It is formulated into a non volatile solid consequently its occurrence in air is highly unlikely. Moreover, significant phototransformation in air due to hydroxyl radicals would be expected. Brodifacoum is not expected to contribute to global warming, ozone depletion in the stratosphere, or acidification on the basis of its physical or chemical properties.

#### Terrestrial compartment

No effects of brodifacoum, in soil concentration ranging up to 994 mg/kg dw, were found on earthworms in a test conducted according to the guideline OECD 207. LC50 was determined to be > 994 mg/kg dw, corresponding to a LC50 >879.6 mg/kg in wet weight.

Table 9: Toxicity to soil organisms

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Guideline / Test method** | **Species** | **Endpoint / Type of test** | **Exposure** | | **Results (mg a.s/kg wwt soil)** | | **Reference** |
| **design** | **duration** | **NOEC** | **LC50** |
| OECD 207 | *Eisenia foetida* | LC50 | soil exposure | 14days | 879.6 | >879.6 | Activa / PelGar Brodifacoum and Difenacoum Task Force  CAR a.s.  Doc IIIA 7.5.1.2 |

Justification of PNECsoil:

Since LC50 was determined to be >879 mg/kg ww, when corrected for soil humidity, an assessment factor of 1000 was used in accordance with TGD (2003).

**PNECsoil > 0.88 mg/kg wet weight**

As additional information, brodifacoum-based products are intended for indoor use only, no exposure to soil and groundwater is expected.

#### Non compartment specific effect relevant to the food chain

The exposure of brodifacoum directly to non-target birds and mammals (primary poisoning) and indirectly via target rodent carcasses (secondary poisoning) is considered in the risk assessment.

Table 10: Toxicity to birds and mammals (key studies)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Guideline / Test method** | **Species** | **Endpoint / Type of test / Duration** | **Results** | | **Reference** |
| **NOEC/NO(A)EL** | **LD50** |
| OPPTS 850.2100 | Japanese quail | LD50/ acute oral  Single dose followed by 14 days oservation |  | LD50 = 19 mg a.s/kg bw | Activa / PelGar Brodifacoum and Difenacoum Task Force  CAR a.s.  Doc IIIA 7.5.3.1.1 |
| OECD 416 | Rat Wistar | High dose F1: haemorrhagic diathesies  2-generation | NO(A)EL  Parental (females) = 0.001 mg/kg bw/day) |  | Morris, 1995 |

##### Primary poisoning

Acute/short-term qualitative assessment

Acute primary toxicity for birds and mammals is assessed only qualitatively in accordance with the decision from TMIII-06.

**For mammals** the acute toxicity to rat: a LD50 value =< 5 mg a.s. /kg bwis provided.

Additional endpoints:

According to the combined AR of brodifacoum, a lower **LD50** value of **0.4** **mg a.s. /kg bw** is provided by another applicant. Therefore, as the data set are considered equivalent, the worst case LD50 value from the combined AR is used in the qualitative assessment for comparisons with estimated daily uptakes of brodifacoum (ETE, mg a.s. /kg bw).

**For birds** the acute toxicity to Japanese quail: **LD50 = 19 mg a.s. /kg bw** is provided.

Additional endpoints:

According to the combined AR of brodifacoum, a lower LD50 value of **0.31** **mg a.s. /kg bw** is provided by another applicant. Therefore, as the data set are considered equivalent, the worst case LD50 value from the combined AR is used in the qualitative assessment for comparisons with estimated daily uptakes of brodifacoum (ETE, mg a.s. /kg bw).

Long-term quantitative assessment

For **mammals**, in a two-generation fertility study with rats, a NOAEL of 0.001 mg/kg bw/day was estimated. According to the TGD, the NOAEL is transformed into a NOEC using a conversion factor of 20, and the AForal of 90 is applied to this NOEC, which results in a

**PNECoral (mammal) = 0.001/90 = 1.1E-05 mg/kg bw/day**

**equivalent to**

**PNECoral (mammal) = 0.001\*20/90 = 2.22E-04 mg/kg food**

For **birds** the NOEC for Brodifacoum is based on the results of the chronic toxicity study with Difenacoum (with Japanese Quail), chosen as reference chemical for second generation anticoagulants (NOEC > 0.1 mg Difenacoum /kg diet). An extrapolation factor of 8.05 was applied to correct for differences in toxicity based on the acute test results for Difenacoum (LD50 = 66 mg/kg, male and females) and Brodifacoum (LD50 = 19 mg/kg bw), both related to Japanese quail. Brodifacoum results very toxic to birds, with NOEC = 0.012 mg Brodifacoum/kg diet (obtained as NOEC > 0.1 mg Difenacoum /kg diet / 8.05) and NOEL = 0.0012 mg Brodifacoum/kg bw/d.

According to TGD, an assessment factor of 30 is applied to derive the PNEC:

PNECoral for birds (dose) = 0.0012/30 = 4E-05 mg/ kg bw/ day

equivalent to

PNECoral for birds (conc. In food) = 0.012/30 = 43E-04 mg/kg food

Additional endpoints: According to the combined AR of brodifacoum, a lower **PNECoral for birds** is provided by another applicant. The long-term toxicity was extrapolated by read across to reproduction toxicity of Difenacoum to Japanese Quail (NOEC > 0.1 mg Difenacoum /kg diet), selected as representative compound of the second generation anticoagulants. A factor of 26 was applied to take into account differences in toxicity between the two compounds, with the brodifacoum more toxic than difenacoum. A NOEC = 0.0038 mg Brodifacoum /kg/ diet and a NOEL = 3.85E-04 mg Brodifacoum/kg bw/d are derived.

According to TGD, an assessment factor of 30 is applied to derive the PNEC:

**PNECoral for birds (dose) = 1.3E-05 mg/ kg bw/ day**

**equivalent to**

**PNECoral for birds (conc. In food) = 1.3E-04 mg/kg food**

Therefore, as the data set are considered equivalent, the worst case PNEC from the combined AR is used in the risk assessment.

##### Secondary poisoning

Acute/short-term qualitative assessment

Acute primary toxicity for birds and mammals is assessed only qualitatively in accordance with the decision from TMIII-06.

**For mammals** the acute toxicity to rat:LD50 = 0.4 mg a.s. /kg bw recalculated into **LC50 = 8 mg/kg food**, using the conversion factor bw/dfi of 20 from table 22 in the TGD II is the lowest value for the acute toxicity.

**For birds** a LD50 value of **0.72** **mg a.s. /kg food** is provided by another applicant in the combined AR. No data about the dietary toxicity to birds was submitted by Activa / PelGar Brodifacoum and Difenacoum Task Force in the combined AR.

Long-term quantitative assessment

For **mammals**, in a two-generation fertility study with rats, a NOAEL of 0.001 mg/kg bw/day was estimated. According to the TGD, the NOAEL is transformed into a NOEC using a conversion factor of 20, and the AForal of 90 is applied to this NOEC, which results in a

**PNECoral (mammal) = 0.001\*20/90 = 2.22E-04 mg/kg food**

**equivalent to**

**PNECoral (mammal) = 0.001/90 = 1.1E-05 mg/kg bw/day**

For **birds** the NOEC for Brodifacoum is based on the results of the chronic toxicity study with Difenacoum (with Japanese Quail), chosen as reference chemical for second generation anticoagulants (NOEC > 0.1 mg Difenacoum /kg diet). An extrapolation factor of 8.05 was applied to correct for differences in toxicity based on the acute test results for Difenacoum (LD50 = 66 mg/kg, male and females) and Brodifacoum (LD50 = 19 mg/kg bw), both related to Japanese quail. Brodifacoum results very toxic to birds, with NOEC = 0.012 mg Brodifacoum/kg diet (obtained as NOEC > 0.1 mg Difenacoum /kg diet / 8.05) and NOEL = 0.0012 mg Brodifacoum/kg bw/d.

According to TGD, an assessment factor of 30 is applied to derive the PNEC:

PNECoral for birds (conc. In food) = 0.012/30 = 43E-04 mg/kg food

equivalent to

PNECoral for birds (dose) = 0.0012/30 = 4E-05 mg/ kg bw/ day

Additional endpoints: according to the combined AR of brodifacoum, a lower **PNECoral for birds** is provided by another applicant. The long-term toxicity was extrapolated by read across to reproduction toxicity of Difenacoum to Japanese Quail (NOEC > 0.1 mg Difenacoum /kg diet), selected as representative compound of the second generation anticoagulants. A factor of 26 was applied to take into account differences in toxicity between the two compounds, with the brodifacoum more toxic than difenacoum. A NOEC = 0.0038 mg Brodifacoum /kg/ diet and a NOEL = 3.85E-04 mg Brodifacoum/kg bw/d are derived.

According to TGD, an assessment factor of 30 is applied to derive the PNEC:

**PNECoral for birds (conc. In food) = 1.3E-04 mg/kg food**

**equivalent to**

**PNECoral for birds (dose) = 1.3E-05 mg/ kg bw/ day**

Therefore, as the data set are considered equivalent, the worst case PNEC from the combined AR is used in the risk assessment.

#### Summary of PNECs of the active substance Brodifacoum

Table 11: Summary of the brodifacoum (a.s.) PNECs used for risk assessment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Compartment** | | **Test Value** | **AF** | **PNEC** | **Source** |
| Aquatic | PNECwater | 72h ErC50 = 0.04 mg a.s./L | 1000 | 0.04 µg a.s./L | Combined AR |
| PNECSTP | EC10 > 0.0038 mg a.s. /L | 100 | > 0.0038 mg a.s/L | combined AR |
| Terrestrial | PNECsoil | 14-d LC50 > 879.6 mg a.s. /kg ww soil | 1000 | > 0.88 mg/kg wet weight | Combined AR |
| Primary and secondary poisoning | PNECoral for birds | NOEC = 0.0038 mg/kg food  NOEL = 3.85E-04 mg/kg bw/day | 30 | 1.3E-04 mg/kg food  1.3E-05 mg/ kg bw/ day | Combined AR |
| PNECoral for mammals | NO(A)EL=0.001mg a.s/kg bw/day  NOEC= (0.001\*20)=0.02 mg a.s/kg food | 90 | 1.1E-05 mg/kg bw/day  2.22E-04 mg/kg food | Combined AR |

PNEC values of other applicant of brodifacoum from the combined AR are indicated when they represent worst-case value in comparison with the PNEC values of Activa / PelGar Brodifacoum and Difenacoum Task Force presented in the combined AR. **The lowest PNEC values is used in the risk assessment.**

#### PBT Assessment

Persistence

According to results given in the combined AR, brodifacoum is not readily, inherently or anaerobically biodegradable. In addition, Brodifacoum resulted hydrolytically stable, but undergoes rapid photolysis in water. These results indicate according to screening criteria, that brodicaoum can be considered as potentially persistent (P) very persistent (vP).

Bioaccumulation

Based on log Kow = 6.12 and BCFfish = 35 645 L.Kg-1 (according to Equation 75; TGD), brodifacoum potentially fulfils the B criterion and vB criterion.

Toxicity

Brodifacoum is proposed to be classified as T+; R27/28, T; R48/24/25, N; R50/53. According to the TGD, brodifacoum fulfils the T criterion.

**Brodifacoum is considered a potential PBT, according to the TGD on Risk Assessment (2003)**.

### Effects on environmental organisms for biocidal product

It is important to notice that the applicant did not provide ecotoxicological data about the biocidal product FANGA PATE PRO. Consequently, all the effects assessment is based on the data obtained from the active substance brodifacoum (Combined Assessment Report According to Directive 98/8EC, Active substance in Biocidal Products, Brodifacoum CAS 56073-10-0, Product Type 14 (Rodenticides), RMS Italy, Revision 2: November 2010).

Denatonium benzoate is used in the biocidal product as bittering agent. This substance is classified as “Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment” in the frame of the Directive 91/414/EEC. Nevertheless at the concentration used in FANGA PATE PRO, the substance does not contribute to the classification of the biocidal product.

No other substance used in the biocidal product is classified for the environment.

Therefore, considering that the product contains no substances of concern except brodifacoum, environmental effects following the use of FANGA PATE PRO can be extrapolated from the environmental effects of the active substance brodifacoum only.

#### Aquatic compartment (including water, sediment and STP)

##### Aquatic organisms

Refers to section 2.8.2.1.

##### Sediment dwelling organisms

Refers to section 2.8.2.1

##### STP micro-organisms

Refers to section 2.8.2.1.

#### Atmosphere

Refers to section 2.8.2.2.

#### Terrestrial compartment

Refers to section 2.8.2.3.

#### Non compartment specific effect relevant to the food chain

Refers to section 2.8.2.4.

#### Summary of PNECs

Refers to section 2.8.2.5.

### Environmental exposure assessment

As the product contains no substances of concern except brodifacoum, it is considered that risks posed to environment following the use of the product FANGA PATE PRO can adequately be assessed based on the evaluation conducted for the active substance. Therefore the exposure assessment is carried out with the data obtained from the active substance brodifacoum only.

The product FANGA PATE PRO is a ready-to-use rodenticidal bait containing 0.005% brodifacoum (0.05 g/kg). The product is in the form of a paste supplied in sachet for professional users. The product is used at 30 g for mouse and 180 g for rat / bait point. According to the applicant, the sachets containing the paste are placed in secured bait stations, inside domestic, industrial, and farm buildings. The secured bait points are refilled 4 times over 28 days. Dead rodents and unconsumed baits are removed each week.

As the product is applied indoor only, no environmental compartment is exposed to FANGA PATE PRO. Nevertheless primary and secondary poisoning cannot be excluded. Indeed, pets living in treated buildings could be exposed directly to the product. Moreover even if the product is applied inside buildings, rats can live some days before dying. Therefore, they have the time to escape outside buildings and to be eaten by predators.

* **Major change application for FANGA PATE PRO – 2016**

The product FANGA PATE PRO is a rodenticide bait containing 0.005% brodifacoum (0.05 g/kg). The product is in the paste form (individually packaged in sachet). Pre-filled secured bait boxes are available for non-professional users. The applicant also intends manual application of baits in bait stations for non-professional and professional users. The product is used as 30 g for mouse and 180 g for rat / bait point. The secured bait points are refilled 4 times over 28 days. Dead rodents and unconsumed baits are removed each week.

FANGA PATE PRO is used in the following areas:

* In and around buildings (professional and non-professional use);
* Open areas (professional and non-professional use);
* Waste dumps area (professional use only).

For the intended uses, the terrestrial (including groundwater) compartment is the only relevant compartment of release. The risks are also calculated for primary and secondary poisoning.

#### Aquatic compartment (surface water, sediment, STP)

Exposure of the aquatic compartment *via* the STP after the treatment with rodenticides is only relevant for indoor application of liquid poisons, residues from mixing and cleaning (ESD PT14). As FANGA PATE PRO is a solid form and is intended to be used indoor only, indirect or direct exposure of the aquatic compartment may be considered negligible.

* **Major change application for FANGA PATE PRO – 2016**

Exposure of the aquatic compartment *via* the STP after the treatment with rodenticides is only relevant for sewers. Contamination of surface water, STP or sediment with brodifacoum from the placing of bait in and around buildings, in open areas or in waste dumps is considered negligible according to the ESD PT14.

#### Atmospheric compartment

Due to its physico-chemical properties (low vapour pressure of 2.6 x 10-22 Pa at 20°C and low Henry’s law constant of 2.35 x 10-18 Pa.m3.mol-1), brodifacoum is not expected to be present in the atmosphere in significant quantities. The exposure of air is therefore considered negligible for the application of FANGA PATE PRO biocidal product.

* **Major change application for FANGA PATE PRO – 2016**

Due to its physico-chemical properties (low vapour pressure << 1 x 10-6 Pa and low Henry’s law constant << 2.18 x 10-3 Pa.m3.mol-1), brodifacoum is not expected to be present in the atmosphere in significant quantities. The exposure of air is therefore considered negligible for the application of FANGA PATE PRO biocidal product.

#### Terrestrial compartment (soil and groundwater)

As FANGA PATE PRO is intended to be used indoor only, no exposure to soil and groundwater is expected.

* **Major change application for FANGA PATE PRO – 2016**

In and around buildings :

The exposure assessment has been carried out according to the ESD (Larsen, 2003) for rodenticides (ESD PT14)[[21]](#footnote-22) and the GBPR IV Part B[[22]](#footnote-23). The ESD PT14 indicates that the only primary compartment to be exposed during a use in and around buildings is the terrestrial compartment. Emission calculations to soil and groundwater were conducted with the default parameters of the ESD PT14 as well as the specific information on the product provided by the applicant:

* A brodifacoum concentration of 0.005% (w/w),
* The protection of baits in bait stations,
* Maximal dose rates: 180 g for rats and 30 g for mice,
* Minimal distance between two bait points: 5 m for rats and 1 m for mice,
* Number of refilling times: 5 (default value) / 1.5 (refined parameter).

Exposure of the terrestrial compartment (soil) will occur when brodifacoum bait is deployed outdoors. ESD (Larsen, 2003) considers a scenario that entails outdoor baiting with bait paste around a farm building. In this situation, exposure is assumed to arise through a combination of transfer (direct release) and deposition *via* urine and faeces (disperse release) onto soil. The active substance metabolism is taken into account; ESD (Larsen, 2003) considers that, in general, 90% of the total amount of rodenticide consumed by the target rodents over the duration of the outdoor baiting campaign enters soil via urine and faeces.

Due to the special packaging (sachet) of this product, an estimated direct release during application and use is estimated to be at least 10 times lower compared to the 1% stated in the ESD PT14. Therefore the estimated direct release (Frelease-D-soil) during application and use is set to 0.1% (this refinement was agreed during TMI06).

According to the ESD PT14 and the applicant’s usage, the normal campaign baiting is:

Day 1: Treatment with one normal bait per box ,

Day 3: 100 % replenishment,

Day 7: 25-50 % replenishment,

Day 14: 10 % replenishment,

Day 21: 0% replenishment

The normal campaign baiting is roughly equivalent to 1.5 replenishments corresponding to a total direct release over 28 days.

In both scenarios, the direct and disperse brodifacoum releases (Elocalsoil,) to the relevant soil surfaces may be calculated according to the input values presented in the table below. The different PEC values are calculated using the GBPR equations. The degradation in soil was not considered in the calculations.

Table 12: PEC brodifacoum in soil and groundwater for uses in and around buildings

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | **ESD Default parameters: realistic worst-case** | | **Refined and specific parameters: typical scenario** | |  |
| **Symbol** | **Variable/parameters** | **Rat** | **Mouse** | **Rat** | **Mouse** | **Unit** |
| **INPUTS** | | | | | | |
| Q*prod:* | Amount of product used in control operation for each bait box | 180 | 30 | 180 | 30 | [g] |
| Fc*product*: | Concentration of active substance in product | 0.05 | 0.05 | 0.05 | 0.05 | [g.kg-1] |
| Nsites: | Number of application sites | 10 | 10 | 10 | 10 | [-] |
| N*refil*: | Number of refilling times | 5 | 5 | 1.5 | 1.5 | [-] |
| F*release-D, soil*: | Fraction of product released directly to soil | 0.01 | 0.01 | 0.001 | 0.001 | [-] |
| F*release-ID, soil*: | Fraction released indirectly to soil | 0.9 | 0.9 | 0.9 | 0.9 | [-] |
| Koc | Organic carbon adorption coefficient | 9 155 | 9 155 | 9 155 | 9 155 | [L.kg-1] |
| Distance | Distance between 2 bait points | 5 | 1 | 5 | 1 | [m] |
| AREA*exposed-D*: | Area directly exposed to rodenticide originating from one bait box | 0.09 | 0.09 | 0.09 | 0.09 | [m2] |
| AREA*exposed-ID*: | Area indirectly exposed to rodenticide | 550 | 110 | 550 | 110 | [m2] |
| DEPTH*soil*: | Depth of exposed soil | 0.1 | 0.1 | 0.1 | 0.1 | [m] |
| RHO*soil*: | Density of exposed soil | 1700 | 1700 | 1700 | 1700 | [kg.m-3] |
| **OUTPUTS** | | | | | | |
| Elocal*soil-campaign, direct*: | *Direct emission to soil from a campaign* | 4.50E-03 | 7.50E-04 | 1.35E-04 | 2.25E-05 | [g.camp-1] |
| Elocal*soil-campaign, indirect*: | *Indirect emission to soil from a campaign* | 4.01E-01 | 6.68E-02 | 1.21E-01 | 2.02E-02 | [g.camp-1] |
| Elocal*soil-campaign*: | *Total emission to soil from a campaign* | 4.05E-01 | 6.76E-02 | 1.22E-01 | 2.03E-02 | [g.camp-1] |
| Clocal*soil-D* | *Local concentration in soil due to direct release (AREAexposed-D) after a campaign:* | 2.94E-02 | 4.90E-03 | 8.82E-04 | 1.47E-04 | [mg.kg-1wwt] |
| Clocal*soil-ID* | *Concentration in soil due to indirect (disperse=* *AREAexposed-ID ) release after a campaign:* | 4.29E-03 | 3.57E-03 | 1.30E-03 | 1.08E-03 | [mg.kg-1wwt] |
| **Clocal*soil*** | ***Worst case total concentration in soil =* Clocal*soil-D +* Clocal*soil-ID*** = ***PECsoil*** | **3.37E-02** | **8.48E-03** | **2.18E-03** | **1.23E-03** | **[mg.kg-1wwt]** |
| **Clocalsoil mean concentration** | ***Mean concentration in soil. The total amount of product release (=Elocalsoil-campaign) is divided by the whole area exposed(=AREAexposed-ID)*** | **4.34E-03** | **3.61E-03** | **1.30E-03** | **1.08E-03** | **[mg.kg-1wwt]** |
| Kpsoil | *Partition coefficient solid-water in soil* | 183 | 183 | 183 | 183 | [L.kg-1] |
| Ksoil water | *Soil-water partitioning coefficient* | 275 | 275 | 275 | 275 | [m3.m-3] |
| **PEClocal soil, porew** | ***Worst case concentration in groundwater (based on the total concentration in soil)*** | **2.08E-04** | **5.24E-05** | **1.35E-05** | **7.60E-06** | **[mg.L-1]** |
| **PEClocal soil, porew** | ***Mean concentration in groundwater (based on mean concentration in soil)*** | **2.68E-05** | **2.24E-05** | **8.04E-06** | **6.70E-06** | **[mg.L-1]** |

Open areas :

FANGA PATE PRO is applied in open areas inside or near the openings of the tunnels of the target rodents. According to the ESD (Larsen, 2003), the use near the openings of the tunnels is covered by the assessment of the scenario “in and around buildings” with bait box. Thus this section “Open areas” only assesses the use inside the tunnels during which, according to the scenario presented in ESD (Larsen, 2003), two treatments would typically be applied in the interval of six days. Bait deployment comprises 180 g of product against rats and 30 g against mice per application and per tunnel entrance. Based on a tunnel of 8 cm diameter, worst-case soil exposure is assumed to occur to a depth of 10 cm from the contact half (*i.e*. the burrow floor) of a 30 cm tunnel section in which the bait is placed. This section of tunnel floor is assumed to receive an input corresponding to 5% of the product during application and a further 20% as the bait is consumed.

Considering the localized treated area, the risk for groundwater from this use was not considered relevant.

Table 13 PEC of brodifacoum in soil and groundwater for uses in open area

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | Rat treatment | Mice treatment | unit |
| INPUTS | Qprod: | Amount of product used in control operation | 180 | 30 | [g.burrow-1] |
| Fc*product*: | Fraction of active substance in product | 0.05 | 0.05 | [g a.i. kg-1] |
| N*app*: | Number of application sites | 1 | 1 | [-] |
| N*refil*: | Number of refilling times | 2 | 2 | [-] |
| F*release, soil, appl*: | Fraction of product released to soil during application | 0.05 | 0.05 | [-] |
| F*release, soil, use*: | Fraction of product released to soil during use | 0.2 | 0.2 | [-] |
| Vsoil*exposed*: | Soil volume exposed to rodenticide | 0.0085 | 0.0085 | [m3] |
| RHO*soil*: | Density of wet exposed soil | 1700 | 1700 | [kg.m-3] |
| Koc | Organic carbon adorption coefficient | 9155 | 9155 | [L.kg-1] |
|  | | | | | |
| OUTPUTS | Elocal*soil-campaign* | *Local emission of active substance to soil during a campaign* | 4.50E-03 | 7.50E-04 | [g.camp] |
| Clocal*soil* | *Local concentration in soil after a campaign* | 3.11E-01 | 5.19E-02 | [mg.kg-1wwt] |

Waste dumps :

The default exposure scenario suggests in the event of an infestation outbreak a treatment with 40 kg of baits distributed over an area of 1 ha, with a total of seven applications per year. In this situation, soil exposure is assumed to arise through a combination of deposition via urine and faeces combined with rodenticide contained in the carcasses of poisoned target rodents. In general, ninety percent of the total amount of rodenticide consumed by the target rodents over the duration of each baiting campaign is assumed to enter soil over the 1 ha surface.

FANGA PATE PRO is intended to be used in secured bait boxes or bait stations containing 180 g of biocidal product (0.005%) with 5 m spacing. So to predict the concentration of brodifacoum in soil and groundwater for the uses in waste dump, the intended doses are calculated for the 1 ha surface as below:

**Q*prod*** = (length of the waste dump of 1ha/distance between bait) + 1) x (length of the waste dump of 1ha/distance between bait) x (amount of product per bait point

**Q*prod*** = ((100 m /5 m) + 1) x (100 m / 5 m) x 0.18 kgproduct

**Q*prod*** = 76.5 kg/ha

The ESD (Larsen, 2003) considers that, in general, 90% of the total amount of rodenticide consumed by the target rodents over the duration of the outdoor baiting campaign enters soil via urine and faeces.

Table 14: PEC of brodifacoum in soil and groundwater for uses in waste dump

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | | **Anticoagulant-Rat- ESD default values** | **Dose for rat intended by the applicant** | **Unit** |
| INPUT | **Q*prod*** | Amount of product used in control operation / ha | 40 | 76.5 | [kg.ha-1] |
| **Fc*product*** | Fraction of active substance in product | 0.05 | 0.05 | [g a.i.kg-1] |
| **N*app*** | Number of applications | 7 | 7 | [-] |
| **F*release, soil*** | Fraction of product released to soil | 0.9 | 0.9 | [-] |
| **AREA*exposed*** | Area exposed to rodenticide | 10 000 | 10 000 | [m2] |
| **DEPTH*soil*** | Depth of exposed soil | 0.1 | 0.1 | [m] |
| **RHO*soil*** | Density of wet exposed soil | 1700 | 1700 | [kg.m-3] |
| **Koc** | Organic carbon adsorption coefficient | 9 155 | 9 155 | [L.kg-1] |
| OUTPUT | **Elocal*soil-campaign*** | *Local emission of active substance to soil from a campaign* | 12.6 | 23.8 | [g.camp-1] |
| **Clocal*soil*** | *Local concentration in soil after a campaign* | 7.41E-03 | 1.40E-02 | [mg.kg-1wwt] |
| **Kpsoil** | *Partition coefficient solid-water in soil* | 1.83E+02 | 1.83E+02 | [L.kg-1] |
| **Ksoil water** | *Soil-water partitioning coefficient* | 2.75E+02 | 2.75E+02 | [m3.m-3] |
| **PEClocal soil, porew** | *Concentration in groundwater* | 4.59E-05 | 8.66E-05 | [mg.L-1] |

#### Non-compartmental-specific exposure relevant to the food chain (secondary poisoning)

##### Primary poisoning

As stated in the ESD (Larsen, 2003), primary poisoning hazard to mammals and birds (both wild and domestic) can be considered small when rodenticides are applied according to the label instructions. In the scenario “in and around buildings” when the product is placed in protected bait point, the risk for primary poisoning is mainly for birds and mammals of equal size or smaller as the target rodents, which may be able to enter into the bait stations. Another exposure of non-target animals may arise when target rodents carry bait away from bait stations.

Worst case exposure estimations are based on the equations and default values proposed by the ESD (Larsen, 2003). Some defaults parameters may be replaced by product-specific properties.

* **Major change application for FANGA PATE PRO – 2016**

Non-target birds and mammals may encounter bait containing brodifacoum if they are small enough to be able to reach the bait, or because the bait is inadequately safeguarded or a secured bait point has become damaged, or by finding pieces of bait which have been removed by target rodents. The quantities of brodifacoum potentially accessible to non-target mammals can be calculated based on the size and number of bait at each secured bait point and an estimate of the amount of bait removed from them. The primary poisoning risk assessment is presented in this dossier according to the scenario “in and around building” covering the other uses.

###### Primary poisoning – Tier 1 assessment

The Tier 1 assessment assumes that the whole day’s food requirement is satisfied by consumption of baits and therefore the concentration in food will be the same as the concentration of the active substance in the bait: 50 mg.kg-1 (0.005% w/w of brodifacoum in FANGA PATE PRO).

Hence, **the worst case Tier 1 PECoral is 50 mg.kg-1**.

* **Major change application for FANGA PATE PRO – 2016**

The Tier 1 assessment assumes that the whole day’s food requirement is satisfied by consumption of bait and therefore the concentration in food will be the same as the concentration of the active substance in the bait: 50 mg.kg-1 (0.005% w/w of brodifacoum in FANGA PATE PRO). Hence, **the worst case Tier 1 PEC oral is 50 mg.kg-1**.

**For birds**, a separate, graded assessment of long-term risks of primary poisoning by bait has been done. It is based on different intakes of brodifacoum-treated bait in relation to untreated food, depending on to which extent brodifacoum bait is accessible to birds.

Table 15: PECoral for non-target, birds exposed to brodifacoum in bait removed from secured bait points in and around buildings

|  |  |
| --- | --- |
| **Proportion of bait point contents accessible, expressed as fraction of ingested food (%)** | **Brodifacoum conc. potentially ingested by non-target vertebrates (mg/kg) ≡ PECoral** |
| 100 | 50 |
| 50 | 25 |
| 40 | 20 |
| 30 | 15 |
| 20 | 10 |
| 10 | 5 |
| 5 | 2.5 |
| 2 | 1 |
| 1 | 0.5 |

###### Primary poisoning – Tier 2 assessment, acute exposure

According to ESD (Larsen, 2003), a Tier 2 assessment can be done estimating a daily uptake of a compound (ETE, mg.kg-1bw.d-1) by non-target animals according to the equation 19 of ESD:

With:

FIR: food intake rate of the indicator species (g.d-1),

BW: indicator species body weight (g),

C: concentration of the active substance in fresh diet (mg.kg-1),

AV: avoidance factor (-),

PT: fraction of diet obtained in treated area (-),

PD: the fraction of the food type in the diet (-).

In Tier 2 Step 1 (worst case) AV, PT and PD are all set at 1. In Step 2 (realistic worst case) AV and PT are refined to 0.9 and 0.8, respectively.

Table 16: Expected concentrations of brodifacoum in non-target animals in the worst case (Step 1) and realistic worst case (Step 2) for acute situations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Non-target animal** | **BW (g)a** | **FIR**  **(g dry weight.day-1)** | **C (mg.kg-1)** | **ETE = concentration of brodifacoum after one meal**  **(mg.kg-1 bw.d-1)** | |
|  | | | | **Step 1** | **Step 2** |
| **Dog** | 10 000 | 456b | 50 | 2.28 | 1.64 |
| **Pig** | 80 000 | 600a | 50 | 0.38 | 0.27 |
| **Pig young** | 25 000 | 600a | 50 | 1.20 | 0.86 |
| **Tree sparrow** | 22 | 7.6 a | 50 | 17.27 | 12.44 |
| **Chaffinch** | 21.4 | 6.42 a | 50 | 15.00 | 10.80 |
| **Wood pigeon** | 490 | 53.1 a | 50 | 5.42 | 3.90 |
| **Pheasant** | 953 | 102.7 a | 50 | 5.39 | 3.88 |

a From EUBEES 2, Table 3.1, section 3.2.1

b From EUBEES 2, using the equation log FIR = 0.822 log BW - 0.629 (for mammals)

* **Major change application for FANGA PATE PRO – 2016**

According to ESD (Larsen, 2003), a Tier 2 assessment can be done estimating a daily uptake of a compound (ETE, mg.kg-1bw.d-1) by non-target animals according to the equation 19 of ESD:

**ETE = (FIR/BW) \* C \* AV \* PT \* PD (mg brodifacoum /kg bw/day)**

With:

ETE is the estimated daily uptake of the active substance (mg.kg-1bw.d-1),

FIR: food intake rate of the indicator species (g.d-1),

BW: indicator species body weight (g),

C: concentration of the active substance in fresh diet (mg.kg-1),

AV: avoidance factor (-),

PT: fraction of diet obtained in treated area (-),

PD: the fraction of the food type in the diet (-).

In the same ESD, in Tier 2 step 1 (worst case) AV, PT and PD are all set at 1; in Step 2 (realistic worst case) AV and PT are refined to 0.9 and 0.8, respectively.

Table 17: Expected concentrations of brodifacoum in non-target animals in the worst case (Step 1) and realistic worst case (Step 2) for acute situations.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Non-target mammal** | **BW (g)a** | **FIR**  **(g dry weight.day-1)** | **C (mg.kg-1)** | **ETE = concentration of brodifacoum after one meal**  **(mg.kg-1 bw.d-1)** | |
| **Step 1** | **Step 2** |
| **Dog** | 10 000 | 456b | 50 | 2.3 | 1.6 |
| **Pig** | 80 000 | 600a | 50 | 0.4 | 0.3 |
| **Pig, young** | 25 000 | 600a | 50 | 1.2 | 0.9 |
| **Tree sparrow** | 22 | 7.6a | 50 | 17.3 | 12.4 |
| **Chaffinch** | 21.4 | 6.42a | 50 | 15.0 | 10.8 |
| **Wood pigeon** | 490 | 53.1a | 50 | 5.4 | 3.9 |
| **Pheasant** | 953 | 102.7a | 50 | 5.4 | 3.9 |

a From EUBEES 2, Table 3.1, Section 3.2.1.

b From EUBEES 2, using the equation log FIR = 0.822 log BW – 0.629 (for mammals)

###### Primary poisoning – Tier 2 assessment, long-term exposure

The long-term risks of brodifacoum are determined by the expected concentrations (EC) in the animal after metabolisation and elimination, which is regarded as PEC. The EC values are calculated on the basis of the actual dose of the substance consumed by a non-target animal each day (ETE) using the realistic worst case scenario (Step 2), calculated above. Calculations are performed according to the equation 20 of the ESD.

According to the ESD, a default value of 0.3 for daily uptake eliminated (El) can be used if no studies are submitted. The EC values are the expected concentrations of active substance brodifacoum in non-target animals in primary poisoning scenarios after one meal followed by a 24 hour elimination period.

Table 18: Expected concentrations of brodifacoum in non-target animals in realistic worst case (Step 2) for long-term situation.

|  |  |
| --- | --- |
| **Non-target animal** | **EC, conc. of brodifacoum after one day of elimination (mg.kg-1 bw)** |
|  | **Step 2** |
| **Dog** | 1.15 |
| **Pig** | 0.19 |
| **Pig young** | 0.60 |
| **Tree sparrow** | 8.71 |
| **Chaffinch** | 7.56 |
| **Wood pigeon** | 2.73 |
| **Pheasant** | 2.72 |

* **Major change application for FANGA PATE PRO – 2016**

The long-term risks of brodifacoum are determined by the expected concentrations (EC) in the animal after metabolism and elimination, which is regarded as PEC. The EC are calculated by using the actual dose of the substance consumed by a non-target animal each day (ETE) using the realistic worst case scenario (Step 2), calculated above. When calculating the long-term risks, elimination and metabolism of the substance (El) have to be considered. Calculations are performed according to the equation 20 of the ESD (Larsen, 2003).

**EC = ETE\*(1-El)**

According to the ESD (Larsen, 2003), a default value of 0.3 for daily uptake eliminated (El) can be used if no studies are submitted. The EC values are the expected concentration of active substance brodifacoum in non-target animals in primary poisoning scenarios after one meal followed by 24 hour elimination period.

Table 19: Expected concentrations of brodifacoum in non-target animals in realistic worst case (Step 2) for long-term situation.

|  |  |
| --- | --- |
| **Non-target animal** | **PEC: EC, concentration of brodifacoum after one day elimination (mg/kg)** |
| Dog | 1.16 |
| Pig | 0.17 |
| Pig, young | 0.60 |
| Tree sparrow | 8.71 |
| Chaffinch | 7.56 |
| Wood pigeon | 2.73 |
| Pheasant | 2.73 |

##### Secondary poisoning

***Secondary poisoning via the aquatic food chain***

As no exposure of the aquatic compartment is foreseen with the use of FANGA PATE PRO inside buildings, no risk assessment for secondary poisoning through the aquatic food chain is required.

* **Major change application for FANGA PATE PRO – 2016**

As no exposure of the aquatic compartment is foreseen with the use of FANGA PATE PRO for the uses in and around buildings, in open areas and in waste dumps, no risk assessment for secondary poisoning through the aquatic food chain is required.

***Secondary poisoning via the terrestrial food chain***

As no exposure of the terrestrial compartment is foreseen with the use of FANGA PATE PRO inside buildings, no risk assessment for secondary poisoning through the terrestrial food chain is needed.

* **Major change application for FANGA PATE PRO – 2016**

According to the GBPR secondary poisoning through the terrestrial route is soil → terrestrial organisms (earthworm) → earthworm-eating mammal or bird. Since birds and mammals consume worms with their gut contents and the gut of earthworms can contain substantial amounts of soil, the exposure of the predators may be affected by the amount of substance that is in the soil. The risk assessment for secondary poisoning for earthworm-eating mammals and birds has been carried out for the in and around use and for the waste dump application. As the use in open area is localised, the exposure of earthworm was deemed negligible in this case.

The calculation is done according to equation 80 and 82 (GBPR, 2015):

**PEC oral, predator = C earthworm**

**C earthworm = (BCF earthworm \* C porewater) + C local soil mean concentration \* F gut \* CONV soil) / (1+Fgut \* CONV soil)**

With (example for rat treatment application for the in and around - typical scenario):

BCF earthworm (bioconcentration factor for earthworms on wet weight basis) =**15 820** L.kg wet earthworm-1,

Cporewater (concentration in pore water) = **8.04E-06** mg.L-1, based on mean concentration in soil– typical case,

C local soil mean concentration (concentration in soil) = **1.30E-03** mg.kg-1wwt, based on mean concentration in soil– typical case,

F gut (fraction of gut loading in worm, default value) = 0.1 kg dwt.kg wwt-1,

CONV soil (conversion factor for soil concentration wet-dry weight soil) = 1.13 kg wwt.kg dwt-1,

According to the GBPR, the most appropriate scenario is that 50% of the diet comes from a local area and 50% comes from the regional area, thus when the PEC local, soil is used in calculation, the PEC oral, predator to be used in risk assessment is C earthworm x 0.5.

Table 20:Expected concentrations of brodifacoum in predator

|  |  |  |
| --- | --- | --- |
|  | **PEC oral, predator mg/kg wet earthworm-1** | |
| **ESD Default parameters: realistic worst-case** | **Refined and specific parameters: typical scenario** |
| ***TIER I: Worst case (based on the total concentration in soil)*** | | |
| *Rat treatment* | 1.48 | 9.59E-02 |
| *Mice treatment* | 0.37 | 5.41E-02 |
| ***TIER I: Mean (based on the mean concentration in soil)*** | | |
| *Rat treatment* | 0.19 | 5.72E-02 |
| *Mice treatment* | 0.16 | 4.76E-02 |
| ***TIER II: Mean (based on the mean concentration in soil) + considering degradation in soil (twa over 180 d with DT50 soil=298)*** | | |
| *Rat treatment* | 0.18 | 5.52E-02 |
| *Mice treatment* | 0.15 | 4.60E-02 |

***Secondary poisoning for the rodent-eating mammal or the rodent-eating bird***

According to the ESD (Larsen, 2003) document, for uses ‘in and around buildings’ it is assumed that predators among mammals and birds may occur inside buildings or they may hunt rats in the immediate vicinity of buildings (parks and gardens or further away). Scavengers may also search for food close to buildings.

Therefore secondary poisoning through poisoned rats exists, even in case of an indoor use. Secondary poisoning hazard can only be ruled out completely when the rodenticide is used in fully enclosed spaces so that rodents cannot move to outdoor areas or to (parts of) buildings where predators may have access.

* **Major change application for FANGA PATE PRO – 2016**

According to the ESD (Larsen, 2003) document, for uses ‘in and around buildings’, ‘open areas’ and ‘waste dumps’, it is assumed that predators among mammals and birds may occur inside buildings or they may hunt rats in the immediate vicinity of buildings (parks and gardens or further away). Scavengers may also search for food close to buildings. Therefore secondary poisoning through poisoned rats exists, even in case of an indoor use. Secondary poisoning hazard can only be ruled out completely when the rodenticide is used in fully enclosed spaces so that rodents cannot move to outdoor areas or to (parts of) buildings where predators may have access.

###### Secondary poisoning - Tier 1 assessment, acute

Calculations of the risk for secondary poisoning of scavengers and predators are done by determining the concentration of brodifacoum in their food, i.e. the poisoned rodents. This PECoral is then compared to the LC50 values for a qualitative risk assessment in accordance with the decision from TM III-06. According to the ESD section 3.3.1, the consumption of rodenticides makes up at least 20 % of total consumptions in a choice test and could in a worst case be up to 100 %, whilst 50 % would be considered as the normal situation. Therefore, in the calculations the fractions of the food type in the diet (PD) are set to 0.2, 0.5 and 1.0. The FIR/BW quotient (food intake rate of the indicator species/indicator species body weight) is a default value set to 0.1, i.e. it is assumed that the rats eat 10 % of their bodyweight each day. The avoidance factor (AV) and the fraction of diet (PT) obtained in the area are both set to 1.

The calculations are done according to equation 19 in the ESD:

(mg.kg-1bw.d-1)

This equation gives the concentration of brodifacoum in rodent (PECoral) after the first meal. Considering the elimination rate and the mean time to death (seven days), the concentrations in rodents can be calculated each day by the equation 21 in the ESD:

For the active substance brodifacoum, the default value of 0.3 is used for elimination (El).

Table 21: Residues of brodifacoum in target animals at specific points in time and varying bait consumption

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Residues in target animal (mg.kg-1bw)** | | |
| **20%** | **50%** | **100%** |
| **Day 1 after the first meal** | 1.0 | 2.5 | 5.0 |
| **Day 2 before new meal** | 0.7 | 1.8 | 3.5 |
| **Day 5 after the last meal** | 2.8 | 6.9 | 13.9 |
| **Day 7 mean time to death** | 1.4 | 3.4 | 6.8 |

According to the ESD, the concentrations of brodifacoum in rats are at peak after consuming bait during 5 days; thereafter the concentrations in rodents are decreasing until day 7 due to excretion and metabolisation of the rodenticide in rodents. The values from day 5 (after the meal) are used as worst case PECoral.

* **Major change application for FANGA PATE PRO – 2016**

Calculations of the risk for secondary poisoning of scavengers and predators are done by determining the concentration of brodifacoum in their food, i.e. the poisoned rodents. This PECoral is then compared to the LC50 values for a qualitative risk assessment in accordance with the decision from TM III-06. According to the ESD section 3.3.1, the consumption of rodenticides makes up at least 20 % of total consumptions in a choice test and could in a worst case be up to 100 %, whilst 50 % would be considered as the normal situation. Therefore, in the calculations the fractions of the food type in the diet (PD) are set to 0.2, 0.5 and 1.0. The FIR/BW quotient (food intake rate of the indicator species/indicator species body weight) is a default value set to 0.1, i.e. it is assumed that the rats eat 10 % of their bodyweight each day. The avoidance factor (AV) is 1, which means no avoidance, since rats is their natural prey, and the fraction of diet (PT) obtained in the area is set to 1.

The calculation is done according to equation 19 in the ESD:

**ETE = (FIR/BW) \* C \* AV \* PT \* PD (mg brodifacoum.kg bw-1.day-1)**

This equation gives the concentration of brodifacoum in the rat (PECoral) after a meal the first day.

Considering the elimination rate and that the mean time to death is seven days the concentration in the rodents each day can be calculated by the equation 21 in the ESD:

n

For the active substance brodifacoum, the default value of 0.3 is used for elimination (El).

Table 22:Residues of brodifacoum in target animals at specific point in times and varying bait consumption

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Residues in target animal (mg.kg-1 bw)** | | |
| **20%** | **50%** | **100%** |
| Day 1 after the first meal | 1 | 2.5 | 5.0 |
| Day 2 before new meal | 0.7 | 1.8 | 3.5 |
| **Day 5 after the last meal** | 2.8 | 6.9 | **13.9** |
| Day 7 mean time to death | 1.4 | 3.4 | 6.8 |

According to the ESD, the concentrations of brodifacoum in rats are at peak after consuming bait for 5 days; thereafter the concentrations in rodents are decreasing until day 7 due to excretion and metabolism of the rodenticide. The values from day 5 are used as PECoral.

###### Secondary poisoning - Tier 1 assessment, long-term

To assess the risk of long-term secondary poisoning to mammals, the PEC in rodents after 1 day and after 5 days are used considering that the consumption of rodenticides makes up 100% of total consumptions (refer to Table 21).

Table 23: Residues of brodifacoum in target animals at specific points in time and varying bait consumption used in the long term assessment

|  |  |
| --- | --- |
|  | **PECoral**  **Brodifacoum conc. in target rodent (mg.kg-1 bw), ESD default values** |
| **Birds** | **13.9** |
| **Mammals** | **13.9** |

* **Major change application for FANGA PATE PRO – 2016**

To assess the risk of long-term secondary poisoning, the PEC in rodents after 5 days are used considering that the consumption of rodenticides makes up 100% of total consumptions (refer to Table above).

Table 24: Residues of brodifacoum in target animals at specific point in times and varying bait consumption used in the long term assessment

|  |  |
| --- | --- |
| **Birds / Mammals** | **PECoral**  **Brodifacoum conc. in target rodent (mg.kg-1 bw),**  **ESD default values** |
| **Day 5 after the last meal** | 13.9 |

###### Secondary poisoning - Tier 2 assessment, long-term

For the Tier 2 assessment, the average food intake for each species and the average weight of the species have been considered, according to the Table 3.5 in the ESD. The calculations are based on the expected values for uptake of active substance by a mammal predator after a single day of exposure presented as an illustrative example in the ESD.

The amount of a.i. consumed by the non-target animal is 13.9 mg.kg-1 bw for rodents caught on day 5 and 16.6 mg.kg-1 bw for resistant rodents caught on day 14, also assuming that the non-target animals feed to 50 % on the rodents, all in accordance with the ESD. By knowing the amount of a.i. consumed by the non-target animal and the weight of the animal, the PEC (concentration in non-target animal) after one day consumption of rodents can be calculated. The results are presented in Table 25.

Table 25: Expected concentrations of brodifacoum in non-target animals (predators/carnivores) due to secondary poisoning after a single day of exposure (concentration of brodifacoum in rodenticide bait 0.005%). Rodents fed 100% on rodenticide and predators/carnivores fed 50% on poisoned rodents.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | **Normal susceptible rodents caught on day 5** | | **Resistant rodents caught on day 14** | |
| **Species** | **Body weight**  **(g)** | **Daily mean food intake**  **(g.d-1)** | **Amount a.i. (mg)1** | **Conc. (mg.kg-1)2** | **Amount a.i. (mg)1** | **Conc. (mg.kg-1)2** |
| **Barn owl**  ***(Tyto alba)*** | 295 | 72.9 | 0.51 | 1.7 | 0.60 | 2.1 |
| **Kestrel**  ***(Falco tinnunculus)*** | 209 | 78.7 | 0.55 | 2.6 | 0.65 | 3.1 |
| **Little owl**  ***(Athene noctua)*** | 164 | 46.4 | 0.32 | 2.0 | 0.38 | 2.3 |
| **Tawny owl**  ***(Strix aluco)*** | 426 | 97.1 | 0.67 | 1.6 | 0.80 | 1.9 |
| **Fox**  ***(Vulpes vulpes)*** | 5700 | 520.2 | 3.61 | 0.6 | 4.31 | 0.8 |
| **Polecat**  ***(Mustela putorius)*** | 689 | 130.9 | 0.91 | 1.3 | 1.08 | 1.6 |
| **Stoat**  ***(Mustela erminea)*** | 205 | 55.7 | 0.39 | 1.9 | 0.46 | 2.3 |
| **Weasel**  ***(Mustela nivlis)*** | 63 | 24.7 | 0.17 | 2.7 | 0.20 | 3.3 |

1Amount a.i. consumed by non-target animal

2 Conc. in non-target animal

* **Major change application for FANGA PATE PRO – 2016**

For the Tier 2 assessment the average food intake for each species and the average weight of the species have been considered, according to the Table 3.5 in the ESD. The calculations are based on the expected values for uptake of active substance by a mammal predator after a single day of exposure presented as an illustrative example in the ESD.

The amount of a.i. consumed by the non-target animal is 13.9 mg.kg-1 bw for rodents caught on day 5 and 16.6 mg.kg-1 bw for rodents caught on day 14, also assuming that the non-target animals feed to 50 % on the rodents, all in accordance with the ESD. By knowing the amount of a.i. consumed by the non-target animal and the weight of the animal, the PEC (concentration in non-target animal) after one day consumption of rodents can be calculated. The results are presented in Table below.

Table 26: Expected concentrations of brodifacoum in non-target animals (predators/carnivores) due to secondary poisoning after a single day of exposure (concentration of brodifacoum in rodenticide bait 0.005%). Rodents fed 100% on rodenticide and predators/carnivores fed 50% on poisoned rodents

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | | **Normal susceptible rodents caught on day 5** | | **Resistant rodents caught on day 14** | |
| **Species** | **Body weight**  **(g)** | **Daily mean food intake**  **(g.d-1)** | **Amount a.i. (mg)1** | **Conc. (mg.kg-1)2** | **Amount a.i. (mg)1** | **Conc. (mg.kg-1)2** |
| Barn owl  *(Tyto alba)* | 294 | 72.9 | 0.51 | 1.72 | 0.60 | 2.05 |
| Kestrel  *(Falco tinnunculus)* | 209 | 78.7 | 0.55 | 2.61 | 0.65 | 3.12 |
| Little owl  *(Athene noctua)* | 164 | 46.4 | 0.32 | 1.96 | 0.38 | 2.34 |
| Tawny owl  *(Strix aluco)* | 426 | 97.1 | 0.67 | 1.58 | 0.80 | 1.89 |
| Fox  *(Vulpes vulpes)* | 5700 | 520.2 | 3.61 | 0.63 | 4.31 | 0.76 |
| Polecat  *(Mustela putorius)* | 689 | 130.9 | 0.91 | 1.32 | 1.08 | 1.57 |
| Stoat  *(Mustela erminea)* | 205 | 55.7 | 0.39 | 1.88 | 0.46 | 2.25 |
| Weasel  *(Mustela nivlis)* | 63 | 24.7 | 0.17 | 2.72 | 0.20 | 3.25 |

1Amount a.i. consumed by non-target animal

2 Conc. in non-target animal.

### Risk characterisation for the environment

#### Primary poisoning

Risk characterization for the environment is done quantitatively by comparing predicted environmental concentrations (PEC) and the concentrations below which effects on organism will not occur (PNEC and/or LD50) according to the guidance in Technical guidance document (TGD, 2003) and “Emission Scenario document for biocides used as rodenticides” (Larsen, 2003, ESD PT14).

The environmental risk characterization has been carried out for brodifacoum.

##### Tier 1 assessment

The PEC value for Tier 1 assessment is compared to the long-term PNEC for mammals and birds.

Table 27: Tier 1 risk characterization of primary poisoning – Long-Term

|  |  |  |  |
| --- | --- | --- | --- |
|  | **PEC1**  **mg.kg food -1** | **PNEC1**  **mg.kg food -1** | **PEC/PNEC** |
| **Birds** | 50 | 1.3E-04 | 384 615 |
| **Mammals** | 50 | 2.22E-04 | 225 225 |

1 Concentration of brodifacoum in food.

For mammals and birds, the resulting PEC/PNEC ratios reveal high risks of long-term primary poisoning.

**Tier 2 assessment – acute**

For the acute situation of primary poisoning, only a qualitative risk assessment is carried out in accordance with the decision from TM III-06. In this Tier 2 acute qualitative assessment, the PEC values are compared to the LD50 values.

Table 28: Tier 2 acute qualitative risk assessment of primary poisoning

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **PECoral1**  **mg.kg-1 bw** | | **LD50 dose**  **mg.kg-1 bw d-1** | **PECoral > LD50**  **(y/n)** | |
| **Step 1** | **Step 2** | **Step 1** | **Step 2** |
| **Dog** | 2.28 | 1.64 | 0.40 | y | y |
| **Pig** | 0.38 | 0.27 | n | n |
| **Pig young** | 1.20 | 0.86 | y | y |
| **Tree sparrow** | 17.27 | 12.44 | 0.31 | y | y |
| **Chaffinch** | 15.00 | 10.80 | y | y |
| **Wood pigeon** | 5.42 | 3.90 | y | y |
| **Pheasant** | 5.39 | 3.88 | y | y |

1 PECoral = ETE, concentration of brodifacoum after one meal

This comparison indicates that the situation for mammals is uncertain. Dogs and young pigs are at risk while pigs are not at risk but very close to the trigger value. On the other hand, this comparison indicates that all birds are at risk for acute primary poisoning.

**Tier 2 assessment – long-term**

The PEC values are compared to the PNEC values.

Table 29: Tier 2 long-term risk assessment of primary poisoning

|  |  |  |  |
| --- | --- | --- | --- |
|  | **PECoral1**  **mg.kg-1 bw** | **PNEC**  **mg.kg-1 bw d-1** | **PEC /PNEC** |
| **Step 2** | | |
| **Dog** | 1.15 | 1.1E-05 | **104 545** |
| **Pig** | 0.19 | **17 273** |
| **Pig young** | 0.60 | **54 545** |
| **Tree sparrow** | 8.71 | 1.3E-05 | **670 000** |
| **Chaffinch** | 7.56 | **581 538** |
| **Wood pigeon** | 2.73 | **210 000** |
| **Pheasant** | 2.72 | **209 231** |

1 PECoral = EC, concentration of brodifacoum after one day of elimination

The risk characterization indicates a very high risk to non-target mammals and birds from direct eating of bait. Primary poisoning incidents can be minimized by preventing the access of non-target animals to the baits. It is assumed in the ESD that if the rodenticide baits are use according to the label instructions, the risk for primary poisoning is negligible. However, it is stated at the EU level that it may not be possible to exclude exposure of all non-target animals, as the baits have to be accessible to target rodents, they may as well be accessible to non-target mammals birds of equal or smaller size than the target rodents.

Nevertheless, as the product FANGA PATE PRO is intended to be used indoor and in bait stations only, primary poisoning can therefore be considered negligible as domestic animals can be kept away from the product, and wild animals other than rats and mice are not expected to be found inside buildings.

#### Secondary poisoning

The only relevant scenario of secondary poisoning in the case of an indoor application only is for the rodent-eating mammal or bird.

##### Tier 1 assessment, acute

The PECoral are compared to the LC50 value presented in the section above for qualitative risk assessment in accordance with the decisions taken at the TMII-06.

Table 30: Tier 1 long-term risk assessment of secondary poisoning

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Non-target animal** | **PECoral**  **mg.kg-1 bw** | | | **LC50 dose**  **mg.kg-1 food** | **PECoral > LC50**  **(y/n)** | | |
| **PD=0.2** | **PD=0.5** | **PD=1** | **PD=0.2** | **PD=0.5** | **PD=1** |
| **Birds** | 2.8 | 6.9 | 13.9 | 8 | n | n | y |
| **Mammals** | 2.8 | 6.9 | 13.9 | 0.72 | y | y | y |

PECoral = Expected concentration in rodent caught on day 5 after meal

PD = fraction of the food type in the diet

This qualitative risk assessment indicates risk for birds with a fraction of the food type in the diet of 1 and with a PEC in rodent caught on day 5 after meal, and indicates risk for mammals at all fractions of food type in the diet and with a PEC in rodent caught on day 5 after meal.

**Tier 1 assessment, long-term**

To assess the risk of long-term secondary poisoning, the PEC in rodents after 5 days is used and compared to the long-term PNECoral for birds and mammals.

Table 31: Tier 1 long-term risk assessment of secondary poisoning

|  |  |  |  |
| --- | --- | --- | --- |
| **Non-target animal** | **PECoral**  **mg.kg-1 bw** | **PNEC**  **mg.kg-1 food** | **PEC /PNEC** |
| **Birds** | 13.9 | 1.3E-04 | 106 923 |
| **Mammals** | 13.9 | 2.22E-04 | 62 613 |

PECoral = Expected concentration in rodent caught on day 5 after meal

The tier 1 long-term assessment indicates very high risks of long-term secondary poisoning for birds and mammals.

**Tier 2 assessment, long-term**

**Table 32: Tier 2 long-term risk assessment of secondary poisoning**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Species** | **PEC (mg/kg bw)** | | **PNEC (mg/kg bw)** | **PEC/PNEC** | |
| **day 5** | **day 14** |  | **day 5** | **day 14** |
| **Barn owl**  ***(Tyto alba)*** | 1.7 | 2.1 | 1.3E-05 | **130 769** | **161 538** |
| **Kestrel**  ***(Falco tinnunculus)*** | 2.6 | 3.1 | **200 000** | **238 462** |
| **Little owl**  ***(Athene noctua)*** | 2.0 | 2.3 | **153 846** | **176 923** |
| **Tawny owl**  ***(Strix aluco)*** | 1.6 | 1.9 | **123 077** | **146 154** |
| **Fox**  ***(Vulpes vulpes)*** | 0.6 | 0.8 | 1.1E-05 | **54 545** | **72 727** |
| **Polecat**  ***(Mustela putorius)*** | 1.3 | 1.6 | **118 182** | **145 455** |
| **Stoat**  ***(Mustela erminea)*** | 1.9 | 2.3 | **172 727** | **209 091** |
| **Weasel**  ***(Mustela nivlis)*** | 2.7 | 3.3 | **245 455** | **300 000** |

The tier 2 risk characterisation shows very high risks for secondary poisoning at long-term for birds and mammals.

However, considering the fact that FANGA PATE PRO is intended to be used indoor only, it can be assumed that, applying use restrictions (such as collecting dead rodents), the risk for secondary poisoning will be lower.

Nevertheless, in order to reduce the risk of secondary poisoning, it is very important to follow the use instructions of the rodenticide baits. The risk reduction measures are considered in the following section.

* **Major change application for FANGA PATE PRO – 2016**

Risk characterization for the environment is done quantitatively by comparing predicted environmental concentrations (PEC) and the concentrations below which effects on organism will not occur (PNEC and/or LD50) according to the guidance in GBPR and “Emission Scenario document for biocides used as rodenticides” (Larsen, 2003, ESD PT14).

The environmental risk characterization has been carried out for brodifacoum.

##### Aquatic compartment (including water, sediment and STP)

###### ***In and around building***

Exposure scenario is not considered relevant in the ESD for rodenticides. Brodifacoum is not expected to occur to any significant extent following the use of FANGA B+ in and around buildings. Therefore, PEC values for brodifacoum in surface water and sediment are assumed to be negligible and have not been further considered.

###### ***Open areas***

Exposure of surface water arising from the use of FANGA PATE PRO bait in open areas is not expected to be significant or widespread for open area uses. Therefore, estimates of brodifacoum concentrations in surface water have not been calculated and aquatic PEC/PNEC ratios are not presented. Since the scope for exposure is negligible, the risks presented to aquatic biota by brodifacoum are expected to be very low. No further assessment of risk is necessary.

###### ***Waste dumps***

Exposure of surface water arising from the use of FANGA PATE PRO bait is not expected to be significant or widespread for waste dump uses. Therefore, estimates of brodifacoum concentrations in surface water have not been calculated and aquatic PEC/PNEC ratios are not presented. Since the scope for exposure is negligible, the risks presented to aquatic biota by brodifacoum deployed in waste dumps are expected to be very low. No further assessment of risk is necessary.

##### Atmospheric compartment

Due to its physico-chemical properties (low vapour pressure << 1 x 10-6 Pa and low Henry’s law constant << 2.18 x 10-3 Pa.m3.mol-1), brodifacoum is not expected to be present in the atmosphere in significant quantities. The exposure of air is therefore considered negligible for the application of FANGA PATE PRO biocidal product.

##### Terrestrial compartment (including soil and groundwater)

Soil exposure occurs both through a combination of direct and indirect releases from the use of FANGA PATE PRO bait in the scenario ‘in and around buildings’, ‘open areas’ and ‘waste dump’.

###### ***In and around building***

Exposure of the terrestrial compartment (soil) will occur when FANGA PATE PRO is deployed outdoors.

Realistic worst case and typical case predicted soil concentrations (PECs) have been calculated for the use scenario in and around buildings, for application in control campaign. The resulting PEC/PNEC ratios for the worst case scenario (addition of direct and indirect exposure) for the soil are summarized in the table below:

Table 33: PECsoil/PNECsoil for soil organisms exposed to brodifacoum following outdoor use of bait around buildings

|  |  |  |  |
| --- | --- | --- | --- |
| **Baiting scenario**  **(ESD PT14)** | **PECsoil (mean value)**  **(mg brodifacoum.kg wwt soil-1)** | **PNECsoil (mg brodifacoum.kg wwt soil-1)** | **PEC/PNEC ratio** |
| **Realistic worst case** | | | |
| Rat treatment | 4.34E-03 | 0.88 | 4.93E-03 |
| Mice treatment: | 3.61E-03 | 4.10E-03 |
| **Typical scenario** | | | |
| Rat treatment | 1.30E-03 | 0.88 | 1.48E-03 |
| Mice treatment | 1.08E-03 | 1.23E-03 |

The PEC/PNEC ratios are below 1 indicating no unacceptable risks to the terrestrial compartment when the product FANGA PATE PRO is used in and around building.

The risk is acceptable in groundwater for the use of FANGA PATE PRO in and around building as presented below:

Table 34: PEC groundwater due to use of FANGA PATE PRO in and around building

|  |  |  |  |
| --- | --- | --- | --- |
| **Baiting scenario**  **(ESD PT14)** | **PEC groundwater (µg brodifacoum.L-1)** | **Threshold value in groundwater (µg.L-1)** | **Risk characterization** |
| **Realistic worst case** | | | |
| Rat treatment | 0.027 | 0.1 | Acceptable |
| Mice treatment | 0.022 |
| **Typical scenario** | | | |
| Rat treatment | 0.008 | 0.1 | Acceptable |
| Mice treatment | 0.067 |

* **Major change application for FANGA PATE 25 – 2018**

|  |  |  |  |
| --- | --- | --- | --- |
| **Baiting scenario**  **(ESD PT14)** | **PEC groundwater (µg brodifacoum.L-1)** | **Threshold value in groundwater (µg.L-1)** | **Risk characterization** |
| **Realistic worst case** | | | |
| Rat treatment | 0.027 | 0.03\* | Acceptable |
| Mice treatment | 0.022 |
| **Typical scenario** | | | |
| Rat treatment | 0.008 | 0.03\* | Acceptable |
| Mice treatment | 0.067 |

* \*0.03µg/L corresponds on the threshold value for the toxicity in drinking water.

###### ***Open areas***

Exposure of the terrestrial compartment (soil) will occur when FANGA PATE PRO bait is applied in open areas by inserting inside the openings of the tunnels of the target rodents.

Predicted soil concentrations (PECs) have been calculated for the use scenario in open areas, for application in rats/rodents control campaign according to the doses claimed by the applicant. The resulting PEC/PNEC ratios for the soil are summarized in the table below:

Table 35: PECsoil/PNECsoil for soil organisms exposed to brodifacoum following use of bait in open area

|  |  |  |  |
| --- | --- | --- | --- |
| **Baiting scenario (EUBEES 2)** | **PECsoil**  (mg /kg wwt) | **PNECsoil**  (mg /kg wwt) | **PEC/PNEC** |
| **Typical use (rat treatment)** | 3.11E-01 | 0.88 | 0.353 |
| **Typical use (mice treatment)** | 5.19E-02 | 0.059 |

The PEC/PNEC ratios are below 1.0 and indicate that there are no unacceptable risks to the terrestrial compartment when the product FANGA PATE PRO is used in the tunnels of open areas. According to the EUBEES 2 scenario, the use near the openings of the tunnels is covered by the assessment of the scenario “in and around buildings” with bait box. As argued above (section ’in and around building’), there is no unacceptable risk for the terrestrial compartment (including groundwater) when the FANGA PATE PRO is used near the openings of the tunnels of the target rodents.

Considering the localized treated area in the tunnels, the risk for groundwater was not considered relevant.

###### ***Waste dump***

Predicted soil concentrations (PECs) have been calculated for the use scenario in waste dump. The resulting PEC/PNEC ratios for the soil are summarized in the Table below:

Table 36: PECsoil/PNECsoil for soil organisms exposed to brodifacoum following use of bait at waste dumps

|  |  |  |  |
| --- | --- | --- | --- |
| **Baiting scenario**  **(ESD PT14)** | **PECsoil**  **(mg brodifacoum.kg wwt soil-1)** | **PNECsoil (mg brodifacoum.kg wwt soil-1)** | **PEC/PNEC ratio** |
| **Rat treatment**  **(40 kg.ha-1)** | 7.41E-03 | 0.88 | 8.4E-03 |
| **Rat treatment**  **(76.5 kg.ha-1)** | 1.40E-02 | 0.88 | 1.6E-02 |

The PEC/PNEC ratios are below 1 indicating that there no unacceptable risks to the terrestrial compartment when the product FANGA PATE PRO is used in waste dump.

Table 37: PEC groundwater due to use of FANGA PATE PRO in waste dump

|  |  |  |  |
| --- | --- | --- | --- |
| **Baiting scenario**  **(ESD PT14)** | **PEC groundwater (µg brodifacoum.L-1)** | **Threshold value in groundwater (µg.L-1)** | **Risk characterization** |
| **Rat treatment**  **(40 kg.ha-1)** | 4.59E-02 | 0.1 | Acceptable |
| **Rat treatment**  **(76.5 kg.ha-1)** | 8.66E-02 | Acceptable |

The risk for groundwater is acceptable.

* **Major change application for FANGA PATE 25 – 2018**

|  |  |  |  |
| --- | --- | --- | --- |
| **Baiting scenario**  **(ESD PT14)** | **PEC groundwater (µg brodifacoum.L-1)** | **Threshold value in groundwater (µg.L-1)** | **Risk characterization** |
| **Rat treatment**  **(40 kg.ha-1)** | 4.59E-02 | 0.03\* | Acceptable |
| **Rat treatment**  **(76.5 kg.ha-1)** | 8.66E-02 | Acceptable |

\*0.03µg/L corresponds on the threshold value for the toxicity in drinking water.

Due to the new threshold value in groundwater, the risk is unacceptable. A FOCUS modelling was realised to refine the PEC groundwater: Application rate is calculated from Brodifacoum concentration in soil of 3.825g/application as a worst case leading to a dose rate of 76.5kg.ha-1.

|  |  |
| --- | --- |
| Model used | FOCUS PEARL 4.4.4. |
| Years of simulation | 1 |
| Application rate | 0.003825 kg.ha-1 |
| Standard crop for arable land | Alfalfa |
| Application depth | Incorporation 0 cm |
| Date of application | Twelve applications per year |
| Molar mass | 523.4 g.mol-1 |
| Vapour pressure | 1E-06 Pa at 20°C |
| Water solubility | 0.240 mg.L-1 at 20°C |
| Kom | 5310.3 L.kg-1 at 25°C |
| Freundlich exponent | 1 |
| DT50soil | 298 d at 12°C |
| Coefficient for uptake for plant | 0 |
| Molar activation energy | 54 kJ.mol-1 |

RESULTS :

|  |  |  |  |
| --- | --- | --- | --- |
| **RESULT\_TEXT** | **BRODIFACOUM** | **LOCATION** | **IRRIGATION\_SCHEME** |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | CHATEAUDUN | FOCUS |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | HAMBURG | No |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | JOKIOINEN | No |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | KREMSMUENSTER | No |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | OKEHAMPTON | No |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | PIACENZA | FOCUS |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | PORTO | FOCUS |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | SEVILLA | FOCUS |
| Concentration closest to the 80th percentile (ug/L) | 0.000000 | THIVA | FOCUS |

According to the FOCUS modelling, the risk is acceptable in groundwater for the use of FANGA PATE 25 in waste dump.

##### Non-compartmental specific effects relevant to the food chain

Risk characterization for the environment is done quantitatively by comparing predicted environmental concentrations (PEC) and the concentrations below which effects on organism will not occur (PNEC and/or LD50) according to the GBPR, 2003 and “Emission Scenario document for biocides used as rodenticides” (Larsen, 2003, ESD PT14).

The environmental risk characterization has been carried out for brodifacoum.

Bait containing brodifacoum contains also 50 mg denatonium benzoate per kg, a powerful bittering agent that is intended to deter accidental ingestion of baits by humans. It may also deter some non-target mammals.

###### Primary poisoning

Tier 1 assessment

The PEC value for Tier 1 assessment is compared to the long-term PNEC for mammals and for birds.

Table 38: Tier 1 risk characterization of primary poisoning – Long-Term

|  |  |  |  |
| --- | --- | --- | --- |
|  | **PEC1**  mg.kg food-1 | **PNEC1**  mg.kg food-1 | **PEC/PNEC** |
| **Mammals** | 50 | 2.22E-04 | **225 225** |
| **Birds** | 50 | 1.30E-04 | **384 615** |

1 Concentration of brodifacoum in food.

The resulting PEC/PNEC ratio reveals a high risk of long-term primary poisoning for mammals.

For **birds**, a separate, graded assessment of long-term risks of primary poisoning by bait has been done. It is based on different intakes of brodifacoum-treated bait in relation to untreated food, depending on to which extent brodifacoum bait is accessible to birds. The PNEC for birds has been used as a worst case in the calculations.

Table 39: PEC oral/ PNEC oral for non-target, birds exposed to brodifacoum in bait removed from secured bait points in and around buildings

|  |  |  |  |
| --- | --- | --- | --- |
| **Fraction of ingested food (%)** | **PECoral**  mg.kg food-1 | **PNEC**  mg.kg food-1 | **PEC/PNEC** |
| 100 | 50 | 1.30E-04 | **384 615** |
| 50 | 25 | **192 307** |
| 40 | 20 | **153 846** |
| 30 | 15 | **115 383** |
| 20 | 10 | **76 923** |
| 10 | 5 | **38 461** |
| 5 | 2.5 | **19 231** |
| 2 | 1 | **7 692** |
| 1 | 0.5 | **3846** |

The long-term assessment indicates clearly unacceptable risks even if only 1% of the food is constituted of bait. The risk is, however, mitigated by the prerequisite that good practice requires that secured bait points, containing bait in a chamber not directly accessible from the access hole, be used in locations where a potential for avian exposure exists.

Tier 2 assessment, acute exposure

For the acute situation of primary poisoning only a qualitative risk assessment is carried out in accordance with the decision from TM III-06. In this Tier 2 acute qualitative assessment, the PEC values are compared to the LD50 value.

Table 40: Tier 2 acute qualitative risk assessment of primary poisoning

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **PECoral1**  mg.kg-1 bw | | **LD50 dose**  mg.kg-1 bw d-1 | **PECoral > LD50**  **(y/n)** | |
| Step 1 | Step 2 | Step 1 | Step 2 |
| **Tree sparrow** | 17.25 | 12.45 | 0.31 | y | y |
| **Chaffinch** | 15 | 10.8 | y | y |
| **Wood pigeon** | 5.4 | 3.9 | y | y |
| **Pheasant** | 5.4 | 3.9 | y | y |
| **Dog** | 2.3 | 1.65 | 0.4 | y | y |
| **Pig** | 0.4 | 0.25 | n | n |
| **Pig young** | 1.2 | 0.85 | y | y |

1 PECoral = ETE, concentration of brodifacoum after one meal

The qualitative approach for the acute situation confirms the potential risk of primary poisoning to all species except pigs.

Tier 2 assessment, long-term exposure

The PEC values for the Tier 2 assessment of the long-term exposure are compared to the PNEC values.

Table 41: Tier 2 long-term risk assessment: PECoral/PNECoral for non-target animals in realistic worst case (step 2) for long-term situation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Non-target animal** | **PECoral**1  mg.kg-1 bw | **PNEC**  mg.kg-1 bw d-1 | **PEC/PNEC** | |
| Dog | 1.16 | 1.10E-05 | **104 465** |
| Pig | 0.17 | **17 182** |
| Pig, young | 0.6 | **54 982** |
| Tree sparrow | 8.7 | 1.30E-05 | **669 650** |
| Chaffinch | 7.56 | **581 538** |
| Wood pigeon | 2.73 | **210 066** |
| Pheasant | 2.73 | **208 898** |

1 PECoral = EC, concentration of brodifacoum after one day of elimination

This assessment provides indication of very high risks to both mammals and birds, but, it should be noted that consumption of these quantities of brodifacoum bait is generally not realistic and should be regarded strictly as worst case.

###### Secondary poisoning

***Secondary poisoning via the aquatic food chain***

As no exposure of the aquatic compartment is foreseen with the use of FANGA PATE PRO for the uses in and around buildings, in open areas and in waste dumps, no risk assessment for secondary poisoning through the aquatic food chain is required.

***Secondary poisoning via the terrestrial food chain***

The PEC oral predator values are compared to the long-term PNEC for mammals and for birds.

Table 42:. risk characterization of secondary poisoning via the terrestrial food chain

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PEC oral, predator**  mg/kg wet earthworm-1 | | **PNEC oral**  mg.kg food-1 | | **PEC/PNEC** | | | |
| **ESD Default parameters** | **Typical scenario** | **Mammals** | **Birds** | **ESD Default parameters** | | **Typical scenario** | |
| **Mammals** | **Birds** | **Mammals** | **Birds** |
| ***TIER I: Worst case (based on the total concentration in soil)*** | | | | | | | | |
| *Rat treatment* | 1.48 | 9.59E-02 | 2.22E-04 | 1.30E-04 | **6679** | **11 4 05** | **432** | **737** |
| *Mice treatment* | 0.37 | 5.41E-02 | **1680** | **2 868** | **244** | **416** |
| ***TIER I: Mean (based on the mean concentration in soil)*** | | | | | | | | |
| *Rat treatment* | 0.19 | 5.72E-02 | 2.22E-04 | 1.30E-04 | **859** | **1 468** | **257** | **440** |
| *Mice treatment* | 0.16 | 4.76E-02 | **716** | **1 223** | **215** | **367** |
| ***TIER II (based on time-weight average concentration (180d) in soil)*** | | | | | | | | |
| *Rat treatment* | 0.18 | 5.52E-02 | 2.22E-04 | 1.30E-04 | **830** | **1 417** | **249** | **425** |
| *Mice treatment* | 0.15 | 4.60E-02 | **692** | **1 181** | **207** | **354** |

Whatever the scenario, the PEC/PNEC ratio exceeds 1 for both earthworm eating birds and mammals.

***Secondary poisoning for the rodent-eating mammal or the rodent-eating bird***

Tier 1 assessment, acute

The PECoral are compared to the LC50 value presented in the section above for a qualitative risk assessment in accordance with the decisions taken at the TMII-06.

Table 43Tier 1 long-term risk assessment of secondary poisoning

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Non-target animal** | **PECoral**  mg.kg-1 bw | | | **LC50 dose**  mg.kg-1 food | **PECoral > LC50**  **(y/n)** | | |
| PD=0.2 | PD=0.5 | PD=1 | PD=0.2 | PD=0.5 | PD=1 |
| Birds | 2.8 | 6.9 | 13.9 | 8 | n | n | **y** |
| Mammals | 2.8 | 6.9 | 13.9 | 0.72 | **y** | **y** | **y** |

1 PECoral = Expected concentration in rodent caught on day 5 after meal

PD = fraction of the food type in the diet

This qualitative risk assessment indicates risk for birds, when the fraction of the contaminated food type in the diet reaches 100%, and indicates risk for mammals at all fractions of food type in the diet and with a PEC in rodent caught on day 5 after meal.

Tier 1 assessment, long-term

To assess the risk of long-term secondary poisoning, the PEC in rodents after 5 days is used and compared to the long-term PNECoral for birds and mammals.

Table 44Tier 1 long-term risk assessment of secondary poisoning

|  |  |  |  |
| --- | --- | --- | --- |
| **Non-target animal** | **PECoral**  mg.kg-1 bw | **PNEC**  mg.kg-1 food | **PEC /PNEC** |
| Birds | 13.9 | 1.30E-04 | **106 923** |
| Mammals | 13.9 | 2.22E-04 | **62 613** |

PECoral = Expected concentration in rodent caught on day 5 after meal

The tier 1 long-term assessment indicates very high risks of long-term secondary poisoning for birds and mammals.

Tier 2 assessment, long-term

Table 45: Tier 2 long-term risk assessment of secondary poisoning

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Species** | **PEC (mg/kg bw)** | | **PNEC (mg/kg bw)** | **PEC/PNEC** | |
| **day 5** | **day 14** |  | **day 5** | **day 14** |
| Barn owl  *(Tyto alba)* | 1.72 | 2.05 | 1.30E-05 | 132234 | 157870 |
| Kestrel  *(Falco tinnunculus)* | 2.61 | 3.12 | 200812 | 239744 |
| Little owl  *(Athene noctua)* | 1.96 | 2.34 | 150882 | 180133 |
| Tawny owl  *(Strix aluco)* | 1.58 | 1.89 | 121555 | 145121 |
| Fox  *(Vulpes vulpes)* | 0.63 | 0.76 | 1.10E-05 | 57519 | 68670 |
| Polecat  *(Mustela putorius)* | 1.32 | 1.57 | 119738 | 142952 |
| Stoat  *(Mustela erminea)* | 1.88 | 2.25 | 171244 | 204443 |
| Weasel  *(Mustela nivlis)* | 2.72 | 3.25 | 247098 | 295003 |

The tier 2 risk characterisation shows very high risks for secondary poisoning at long-term for birds and mammals.

Nevertheless, in order to reduce the risk of secondary poisoning, it is very important to follow the use instructions of the rodenticide baits. The risk reduction measures are considered in the section 2.9.

#### Conclusion of the risk assessment for the environment

No studies were conducted with the product FANGA PATE PRO for the environment part; therefore the environmental risk assessment has been carried out with data from the Combined AR of brodifacoum. The environmental risk is considered as limited for the indoor use by professionals, in strict compliance with the specific use instructions of rodenticidal baits and the use restrictions to reduce the risk for primary and secondary poisoning.

***Risk mitigation measures linked to risk assessment for environment***

* Use in tamper-resistant bait boxes or in covered bait stations. The bait stations must be placed only in areas not accessible to the general public and non-target animals.
* Tamper-resistant bait boxes should be clearly marked to show that they contain rodenticides and that they should not contain other products than rodenticides.
* Never wash the tamper-resistant bait boxes and covered bait stations with water.
* Place the tamper-resistant bait boxes and covered bait stations in areas non-liable to floodings.
* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment[[23]](#footnote-24).
* Baits must be unattainable to children, pets or other non-target animals in order to minimize the risk of poisoning.
* Dispose of the tamper-resistant bait boxes and covered bait stations, packaging, uneaten baits and dead rodents in accordance with local requirements.
* Remove all bait points after the end of treatment.
* Do not throw the product on the ground, into a water course, into the sink or down the drain and into the environment.

***Disposal considerations***

* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment24.
* Dispose of the tamper-resistant bait boxes and covered bait stations, packaging, uneaten baits and dead rodents in accordance with local requirements.
* Never wash the tamper-resistant bait boxes and covered bait stations with water.
* Do not throw the product on the ground, into a water course, into the sink or down the drain and into the environment.
* Remove all bait points after the end of treatment.

##### Conclusions for the major change application for FANGA PATE PRO – 2016

No studies were conducted with the product FANGA PATE PRO for the environment part; therefore the environmental risk assessment has been carried out with data from the Combined AR of brodifacoum. The environmental risk is considered as limited for the indoor use by non-professionals and for the use in and around building by professionals, in strict compliance with the specific use instructions of rodenticidal baits and the use restrictions to reduce the risk for primary and secondary poisoning.

Nevertheless, the Authority in charge of the efficacy and risk assessment is not able to assess the applicability of the specific use instructions and restrictions for

* the outdoor applications by non-professionals ;
* the use in open area by professionals;
* the use in waste dump by professionals ;

***Risk mitigation measures linked to risk assessment (non-professionals)***

* Use only in tamper-resistant bait boxes.
* *Tamper-resistant bait boxes should be clearly marked to show that they contain rodenticides and that they should not contain other products than rodenticides.*
* Never wash the tamper-resistant bait boxes with water.
* Place the tamper-resistant bait boxes in areas non-liable to floodings
* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment.
* Do not use in areas accessible to children, pets or other non-target animals in order to minimize the risk of poisoning.
* Dispose of the tamper-resistant bait boxes, uneaten baits and dead rodents in accordance with local requirements.
* Remove all bait points after the end of treatment.
* Do not throw the product on the ground, into a water course, into the sink or down the drain and into the environment.

***Risk mitigation measures linked to risk assessment (professionals)***

* Use only in tamper-resistant bait boxes or covered bait stations in area unattainable to children or non-target animals.
* Tamper-resistant bait boxes should be clearly marked to show that they contain rodenticides and that they should not contain other products than rodenticides.
* Never wash the tamper-resistant bait boxes and covered bait stations with water.
* Never wash the tamper-resistant bait boxes and covered bait stations with water.
* Place the tamper-resistant bait boxes and covered bait stations in areas non-liable to floodings
* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment.
* Do not use in areas accessible to children, pets or other non-target animals in order to minimize the risk of poisoning.
* Dispose of the tamper-resistant bait boxes and covered bait stations, uneaten baits and dead rodents in accordance with local requirements.
* Remove all bait points after the end of treatment.Do not throw the product on the ground, into a water course, into the sink or down the drain and into the environment.

***Disposal considerations***

**Professionnals**

* Dispose of the tamper-resistant bait boxes and covered bait stations, uneaten baits and dead rodents in accordance with local requirements.
* Remove all bait points after the end of treatment.
* Do not throw the product on the ground, into a water course, into the sink or down the drain and into the environment.
* Never wash the tamper-resistant bait boxes and covered bait stations with water.
* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations and dead rodents, during and after treatment.

**Non-profesionnals**

* Dispose of the tamper-resistant bait boxes, uneaten baits and dead rodents in accordance with local requirements.
* Remove all bait points after the end of treatment.
* Do not throw the product on the ground, into a water course, into the sink or down the drain and into the environment.
* Never wash the tamper-resistant bait boxes with water.
* Collect uneaten bait, bait fragments dragged away from the tamper-resistant bait boxes and dead rodents, during and after treatment.
* **Major change application for FANGA PATE 25 – 2018**

In the first authorization of the product, based on the assessment of the product FANGA PATE PRO, the active substance content assessed was 0.005% w/w of brodifacoum. For the major change of FANGA PATE 25, the applicant claimed an active substance content of 0.0025% w/w of brodifacoum. Regarding this new information, the major change assessment is covered by the first assessment presented here below. Therefore, the conclusion of the environmental risk assessment remains unchanged.

***Required information linked to risk assessment for environment***

None.

|  |
| --- |
| * **Renewal application for FANGA RONGEUR PRO 25 - 2019**   No new ecotoxicological information has been submitted at the renewal of the approval of the active substance brodifacoum and in the product dossier. No studies were conducted with the product FANGA PATE 25 for the environment part; therefore the environmental risk assessment has been carried out with data from the combined CAR of brodifacoum. The environmental risk is considered as acceptable for the intended uses except for the primary and secondary poisoning. The specific use restriction must be applied to reduce the risk for primary and secondary poisoning.  **The conclusions remains unchanged.** |

## Measures to protect man, animals and the environment

*See Summary of Product Characteristics (SPC).*

# Proposal for decision – Renewal application 2019

**Summary of product characteristics for a biocidal product**

1. **Administrative information**

**1.1. Trade name(s) of the product**

| **Trade name(s)** | FANGA PATE 25 |
| --- | --- |
|  | PAT‘ATTRACT  RATICIDE PATE BF  BROD’RAT 25  STOP RAT BROD 25  SUPP‘ RAT BROD 25  SUPP‘ RONGEUR BROD 25  RONGEURS PATE 25 |

**1.2. Authorisation holder**

|  |  |  |
| --- | --- | --- |
| **Name and address of the authorisation holder** | **Name** | TRIPLAN SA |
| **Address** | BP 258 L Poste française  AD500 Andorra La Vella  ANDORRE  France |
| **Authorisation number** | BC-XE049434-33 | |

**1.3. Manufacturer(s) of the product**

|  |  |
| --- | --- |
| **Name of manufacturer** | IRIS |
| **Address of manufacturer** | 1126A, Avenue du Moulinas, Route de Saint Privat  30340 SALINDRES  France |
| **Location of manufacturing sites** | 1126A, Avenue du Moulinas, Route de Saint Privat  30340 SALINDRES  France |

|  |  |
| --- | --- |
| **Name of manufacturer** | INDUSTRIAL CHEMICAL SRL |
| **Address of manufacturer** | Via SORGAGLIA 40  35020 ARRE (PD)  Italy |
| **Location of manufacturing sites** | INDUSTRIAL CHEMICAL SRL  Via SORGAGLIA 40  35020 ARRE (PD)  Italy |

|  |  |
| --- | --- |
| **Name of manufacturer** | NOXIMA |
| **Address of manufacturer** | Carrefour Jean Monnet-Lacroix Saint-Ouen  60201 Compiègne  France |
| **Location of manufacturing sites** | NOXIMA  Carrefour Jean Monnet-Lacroix Saint-Ouen  60201 Compiègne  France |

|  |  |
| --- | --- |
| **Name of manufacturer** | FARMAVIT OOD |
| **Address of manufacturer** | Bul Tsar Boris III, n°63, Office n°1  1612 SOFIA  Bulgaria |
| **Location of manufacturing sites** | Industrialna 2 str, Pleven District  5960 GULIANTSI  Bulgaria |

|  |  |
| --- | --- |
| **Name of manufacturer** | SALOMEZ |
| **Address of manufacturer** | ZI Av. du Géneral de GAULLE  89130 Toucy  France |
| **Location of manufacturing sites** | ZI Av. du Géneral de GAULLE  89130 Toucy  France |

|  |  |
| --- | --- |
| **Name of manufacturer** | FARMA –CHEM SA |
| **Address of manufacturer** | Industrial Area of Sindos P.O. Box 1026 Block 53 Zone C  57022 Thessaloniki  Greece |
| **Location of manufacturing sites** | Industrial Area of Sindos P.O. Box 1026 Block 53 Zone C  57022 Thessaloniki  Greece |

**1.4. Manufacturer(s) of the active substance(s)**

|  |  |
| --- | --- |
| **Active substance** | Brodifacoum |
| **Name of manufacturer** | ACTIVA/TEZZA |
| **Address of manufacturer** | Via feltre 32  20132  Milano  Italy |
| **Location of manufacturing sites** | PM TEZZA SRL  Via tre ponti 22  37050.  S.Maria Di Zevio (VR)  Italy |

**2. Product composition and formulation**

**2.1. Qualitative and quantitative information on the composition of the product**

| **Common name** | **IUPAC name** | **Function** | **CAS number** | **EC number** | **Content (%)** |
| --- | --- | --- | --- | --- | --- |
| Brodifacoum | 3-[3-(4'-bromobiphenyl-4-yl)-1,2,3,4-tetrahydro -1-napthyl]-4-hydroxycoumarin | Active substance | 56073-10-0 | 259-980-5 | 0.0025 |

2.2. Type of formulation

|  |
| --- |
| RB-(bait ready for use)-Pasta |

**3. Hazard and precautionary statements according to Regulation (EC) 1272/2008**

|  |  |
| --- | --- |
| **Classification - Regulation (EC) 1272/2008** | |
| Hazard category | STOT RE 2 : Specific toxicity to organs – repeated exposure |
| Hazard statements | H373: May cause damage to organs (blood) through prolonged or repeated exposure |
| Labelling |  |
| Signal words | Warning |
| Hazard statements | H373: May cause damage to organs (blood) through prolonged or repeated exposure |
| Precautionnary statements | P260: Do not breathe dust/fumes/gas/mist/vapours/spray  P314: Get medical advice/attention if you feel unwell  P501: Dispose of contents/container to … [… in accordance with local/regional/national/international regulation (to be specified)]. |
|  |  |
| Note | - |

**4. Authorised use(s)**

**4.1. Use description**

**Table 46. Use # 1 – House mice and/or rats – trained professionals – indoor**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Mus musculus* (house mice)  *Rattus norvegicus* (brown rat)  *Rattus rattus* (black or roof rat) |
| **Field(s) of use** | Indoor |
| **Application method(s)** | Bait formulations:  - Ready-to-use bait to be used in tamper-resistant bait stations[[24]](#footnote-25)  - *[Covered and protected baiting points]* |
| **Application rate(s) and frequency** | Bait products:  Rats  - High infestation: 100 g of bait per baiting point every 5 meters  - Low infestation: 100 g of bait per baiting point every 10 meters  Mice:  - High infestation: 30 g of bait per baiting point every 1 meters  - Low infestation: 30 g of bait per baiting point every 2 meters |
| **Category(ies) of users** | Trained professionals |
| **Pack sizes and packaging material** | The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100g) and PP/PE sachets (10-15-20-25-50-75-100-200-300-400-500-600-700-800-900-1000g).  Heat-sealed paper sachets are packed in:  - PP/PE Buckets-Barrel (5-10-15-18-20-25 kg)  - Carton box with PP/PE protection inside (5-10-12-15-20-50 kg)  - Metal Box-Barrel without lacquer (5-10-12-15-18-20-25-30-40-50 kg)  PP/PE or PE/PP sachets are wrapped or not inside cardboard box (5-10-12-15-18-20-25-30-50 kg)  Minimun packaging size : 3 kg  *(****In France only*** *: minimum pack size of 5 kg)* |

***4.1.1.* *Use-specific instructions for use***

|  |
| --- |
| * Remove the remaining product at the end of treatment period. * Follow any additional instructions provided by the relevant code of best practice. |

***4.1.2 Use-specific risk mitigation measures***

|  |
| --- |
| * Where possible, prior to the treatment inform any possible bystanders (e.g. users of the treated area and their surroundings) about the rodent control campaign [in accordance with the applicable code of good practice, if any]. * Consider preventive control measures (e.g. plug holes, remove potential food and drinking as far as possible) to improve product intake and reduce the likelihood of reinvasion. * To reduce risk of secondary poisoning, search for and remove dead rodents during treatment at frequent intervals, in line with the recommendations provided by the relevant code of best practice. * Do not use the product as permanent baits for the prevention of rodent infestation or monitoring of rodent activities. * Do not use the product in pulsed baiting treatments. |

***4.1.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
| * When placing bait points close to water drainage systems, ensure that bait contact with water is avoided. |

***4.1.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.1.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.2. Use description**

**Table 2. Use # 2 -Mice and/or rats – trained professionals – outdoor around buildings**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Mus musculus* (house mice)  *Rattus norvegicus* (brown rat)  *Rattus rattus* (black or roof rat) |
| **Field(s) of use** | Outdoor around buildings |
| **Application method(s)** | Bait formulations:  - Ready-to-use bait to be used in tamper-resistant bait stations.  - *[Covered and protected baiting points]* |
| **Application rate(s) and frequency** | Bait products:  Rats:  - High infestation: 100 g of bait per baiting point every 5 meters  - Low infestation: 100 g of bait per baiting point every 10 meters  Mice:  - High infestation: 30 g of bait per baiting point every 1 meters  - Low infestation: 30 g of bait per baiting point every 2 meters |
| **Category(ies) of users** | Trained professionals |
| **Pack sizes and packaging material** | The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100g) and PP/PE sachets (10-15-20-25-50-75-100-200-300-400-500-600-700-800-900-1000g).  Heat-sealed paper sachets are packed in:  - PP/PE Buckets-Barrel (5-10-15-18-20-25 kg)  - Carton box with PP/PE protection inside (5-10-12-15-20-50 kg)  - Metal Box-Barrel without lacquer (5-10-12-15-18-20-25-30-40-50 kg)  PP/PE or PE/PP sachets are wrapped or not inside cardboard box (5-10-12-15-18-20-25-30-50 kg)  Minimun packaging size : 3 kg  *(****In France only*** *: minimum pack size of 5 kg)* |

***4.2.1.* *Use-specific instructions for use***

|  |
| --- |
| * Protect bait from the atmospheric conditions. Place the baiting points in areas not liable to flooding. * Replace any bait in baiting points in which bait has been damaged by water or contaminated by dirt. * [When available] Follow any additional instructions provided by the relevant code of best practice. * [For outdoor use, baiting points must be covered and placed in strategic sites to minimise the exposure to non-target species]. |

***4.2.2 Use-specific risk mitigation measures***

|  |
| --- |
| * Where possible, prior to the treatment inform any possible bystanders (e.g. users of the treated area and their surroundings) about the rodent control campaign [in accordance with the applicable code of good practice, if any]. * Consider preventive control measures (plug holes, remove potential food and drinking as far as possible) to improve product intake and reduce the likelihood of reinvasion. * To reduce risk of secondary poisoning, search for and remove dead rodents during treatment at frequent intervals, in line with the recommendations provided by the relevant code of best practice. * Do not use this product as permanent baits for the prevention of rodent infestation or monitoring of rodent activities. * Do not use this product in pulsed baiting treatments. * Do not apply this product directly in the burrows |

***4.2.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
| * When placing bait points close to surface waters (e.g. rivers, ponds, water channels, dykes, irrigation ditches) or water drainage systems, ensure that bait contact with water is avoided. |

***4.2.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.2.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.3. Use description**

**Table 3. Use # 3 – Mice and/or Rats – trained professionals – Outdoor open areas & waste dumps**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Mus musculus* (house mice)  *Rattus norvegicus* (brown rat)  *Rattus rattus* (black or roof rat) |
| **Field(s) of use** | Outdoor open areas  Outdoor waste dumps |
| **Application method(s)** | - Ready-to-use bait to be used in tamper-resistant bait stations.  *- [Covered and protected baiting points]* |
| **Application rate(s) and frequency** | Bait products:  Rats:  - High infestation: 100 g of bait per baiting point every 5 meters  - Low infestation: 100 g of bait per baiting point every 10 meters  Mice:  - High infestation: 30 g of bait per baiting point every 1 meters  - Low infestation: 30 g of bait per baiting point every 2 meters |
| **Category(ies) of users** | Trained professionals |
| **Pack sizes and packaging material** | The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100g) and PP/PE sachets (10-15-20-25-50-75-100-200-300-400-500-600-700-800-900-1000g).  Heat-sealed paper sachets are packed in:  - PP/PE Buckets-Barrel (5-10-15-18-20-25 kg)  - Carton box with PP/PE protection inside (5-10-12-15-20-50 kg)  - Metal Box-Barrel without lacquer (5-10-12-15-18-20-25-30-40-50 kg)  PP/PE or PE/PP sachets are wrapped or not inside cardboard box (5-10-12-15-18-20-25-30-50 kg)  Minimun packaging size : 3 kg  *(****In France only*** *: minimum pack size of 5 kg)* |

***4.3.1.* *Use-specific instructions for use***

|  |
| --- |
| * Protect bait from the atmospheric conditions. Place the bait stations in areas not liable to flooding. * Replace any bait in baiting points in which bait has been damaged by water or contaminated by dirt. * Remove the remaining product at the end of treatment period * [When available] Follow any additional instructions provided by the relevant code of best practice. * [For outdoor use, baiting points must be covered and placed in strategic sites to minimise the exposure to non-target species]. |

***4.3.2 Use-specific risk mitigation measures***

|  |
| --- |
| * Where possible, prior to the treatment inform any possible bystanders (e.g. users of the treated area and their surroundings) about the rodent control campaign [in accordance with the applicable code of good practice, if any]. * To reduce risk of secondary poisoning, search for and remove dead rodents during treatment at frequent intervals, in line with the recommendations provided by the relevant code of best practice. * Do not apply this product directly in the burrows |

***4.3.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
| * When placing bait points close to surface waters (e.g. rivers, ponds, water channels, dykes, irrigation ditches) or water drainage systems, ensure that bait contact with water is avoided. |

***4.3.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.3.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.4. Use description**

**Table 4. Use # 4 *(not relevant in France)*– House mice – professionals – indoor**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Mus musculus* (house mice) |
| **Field(s) of use** | Indoor |
| **Application method(s)** | Ready-to-use bait to be used in tamper-resistant bait stations[[25]](#footnote-26) |
| **Application rate(s) and frequency** | -30 g of bait per bait station. If more than one bait station is needed, the minimum distance between bait stations should be of 1 to 2 meters. |
| **Category(ies) of users** | Professionals |
| **Pack sizes and packaging material** | The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100g) and PP/PE sachets (10-15-20-25-50-75-100-200-300-400-500-600-700-800-900-1000g).  Heat-sealed paper sachets are packed in:  - PP/PE Buckets-Barrel (5-10-15-18-20-25 kg)  - Carton box with PP/PE protection inside (5-10-12-15-20-50 kg)  - Metal Box-Barrel without lacquer (5-10-12-15-18-20-25-30-40-50 kg)  PP/PE or PE/PP sachets are wrapped or not inside cardboard box (5-10-12-15-18-20-25-30-50 kg)  Minimun packaging size : 3 kg |

***4.4.1.* *Use-specific instructions for use***

|  |
| --- |
| * The bait stations should be visited at least every 2 to 3 days at the beginning of the treatment and at least weekly afterwards, in order to check whether the bait is accepted, the bait stations are intact and to remove rodent bodies. Re-fill bait when necessary. * [When available] Follow any additional instructions provided by the relevant code of best practice. |

***4.4.2 Use-specific risk mitigation measures***

|  |
| --- |
|  |

***4.1.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
| * When placing bait stations close to water drainage systems, ensure that bait contact with water is avoided. |

***4.4.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.4.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.5. Use description**

**Table 5 Use # 5 *(not relevant in France)*– Rats – professionals – indoor**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Rattus norvegicus* (brown rat)  *Rattus rattus* (black or roof rat) |
| **Field(s) of use** | Indoor |
| **Application method(s)** | Ready-to-use bait to be used in tamper-resistant bait stations |
| **Application rate(s) and frequency** | 100 g of bait per bait station. If more than one bait station is needed, the minimum distance between bait stations should be of 5 to 10 meters. |
| **Category(ies) of users** | Professionals |
| **Pack sizes and packaging material** | The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100g) and PP/PE sachets (10-15-20-25-50-75-100-200-300-400-500-600-700-800-900-1000g).  Heat-sealed paper sachets are packed in:  - PP/PE Buckets-Barrel (5-10-15-18-20-25 kg)  - Carton box with PP/PE protection inside (5-10-12-15-20-50 kg)  - Metal Box-Barrel without lacquer (5-10-12-15-18-20-25-30-40-50 kg)  PP/PE or PE/PP sachets are wrapped *or not inside cardboard box* (5-10-12-15-18-20-25-30-50 kg)  Minimun packaging size : 3 kg |

***4.5.1.* *Use-specific instructions for use***

|  |
| --- |
| * The bait stations should be visited only 5 to 7 days after the beginning of the treatment and at least weekly afterwards, in order to check whether the bait is accepted, the bait stations are intact and to remove rodent bodies. Re-fill bait when necessary. * [When available] Follow any additional instructions provided by the relevant code of best practice. |

***4.5.2 Use-specific risk mitigation measures***

|  |
| --- |
|  |

***4.5.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
| * When placing bait stations close to water drainage systems, ensure that bait contact with water is avoided. |

***4.5.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.5.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.6. Use description**

**Table 6. Use # 6 *(not relevant in France)* – House mice and/or rats – professionals – outdoor around buildings**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | Mus musculus (house mice)  *Rattus norvegicus* (brown rat)  *Rattus rattus* (black or roof rat) |
| **Field(s) of use** | Outdoor around buildings |
| **Application method(s)** | Ready-to-use bait to be used in tamper-resistant bait stations |
| **Application rate(s) and frequency** | 100 g of bait per bait station. If more than one bait station is needed, the minimum distance between bait stations should be of 5 to 10 meters.  30 g of bait per bait station. If more than one bait station is needed, the minimum distance between bait stations should be of 1 to 2 meters. |
| **Category(ies) of users** | Professionals |
| **Pack sizes and packaging material** | The product FANGA PATE 25 is supplied in heat-sealed paper sachets (5-6-7-8-9-10-20-30-40-50-60-70-80-90-100g) and PP/PE sachets (10-15-20-25-50-75-100-200-300-400-500-600-700-800-900-1000g).  Heat-sealed paper sachets are packed in:  - PP/PE Buckets-Barrel (5-10-15-18-20-25 kg)  - Carton box with PP/PE protection inside (5-10-12-15-20-50 kg)  - Metal Box-Barrel without lacquer (5-10-12-15-18-20-25-30-40-50 kg)  PP/PE or PE/PP sachets are wrapped or not inside cardboard box (5-10-12-15-18-20-25-30-50 kg)  Minimun packaging size : 3 kg |

***4.6.1.* *Use-specific instructions for use***

|  |
| --- |
| * Protect bait from the atmospheric conditions (e.g. rain, snow, etc.). Place the bait stations in areas not liable to flooding. * The bait stations should be visited [for mice - at least every 2 to 3 days at] [for rats - only 5 to 7 days after] the beginning of the treatment and at least weekly afterwards, in order to check whether the bait is accepted, the bait stations are intact and to remove rodent bodies. Re-fill bait when necessary. * Replace any bait in a bait station in which bait has been damaged by water or contaminated by dirt. * [When available] Follow any additional instructions provided by the relevant code of best practice. |

***4.6.2 Use-specific risk mitigation measures***

|  |
| --- |
| * Do not apply this product directly in the burrows. |

***4.6.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
| * When placing bait stations close to surface waters (e.g. rivers, ponds, water channels, dykes, irrigation ditches) or water drainage systems, ensure that bait contact with water is avoided. |

***4.6.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.6.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.7 . Use description-General public**

**Table 7. Use # 7 – House mice – general public – indoor**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Mus musculus* (house mice) |
| **Field(s) of use** | Indoor |
| **Application method(s)** | Ready-to-use bait *[in sachets for loose bait]* to be used in tamper-resistant bait stations[[26]](#footnote-27). |
| **Application rate(s) and frequency** | Bait products:  - 30 g of bait per bait station. If more than one bait station is needed, the minimum distance between bait stations should be of 1 to 2 meters. |
| **Category(ies) of users** | General public |
| **Pack sizes and packaging material** | FANGA PATE 25 is supplied in heat-sealed paper sachets (5, 6, 7, 8, 9, 10, 20, 30g)  Heat-sealed paper sachets are packed in:  - PP/PE bucket (max 150 g)  - Metal box without lacquer (max 150 g)  - PP/PE flacon (max 150 g)  - PE/PP sachets (max 150 g)  - Prefilled tamper resistant PET/PP/PE/PVC bait station.  Maximum packaging size : 150g |

***4.7.1.* *Use-specific instructions for use***

|  |
| --- |
| - The bait stations should be visited at least every 2 to 3 days at the beginning of the treatment and at least weekly afterwards, in order to check whether the bait is accepted, the bait stations are intact and to remove rodent bodies. Re-fill bait when necessary. |

***4.7.2 Use-specific risk mitigation measures***

|  |
| --- |
|  |

***4.7.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
|  |

***4.7.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.7.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.8. Use description**

**Table 8. Use # 8 – Rats – general public – indoor**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Rattus norvegicus* (brown rat)  *Rattus rattus* (black or roof rat) |
| **Field(s) of use** | Indoor. |
| **Application method(s)** | Ready-to-use bait *[in sachets for loose bait]* to be used in tamper-resistant bait stations2. |
| **Application rate(s) and frequency** | Bait products:  - 100 g of bait per bait station. If more than one bait station is needed, the minimum distance between bait stations should be of 5 to 10 meters. |
| **Category(ies) of users** | General public |
| **Pack sizes and packaging material** | FANGA PATE 25 is supplied in heat-sealed paper sachets (5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 g)  Heat-sealed paper sachets are packed in:  - PP/PE bucket (max 150 g)  - Metal box without lacquer (max 150 g)  - PP/PE flacon (max 150 g)  - PE/PP sachets (max 150 g)  - Prefilled tamper resistant PET/PP/PE/PVC bait station.  Maximum packaging size : 150g |

***4.8.1.* *Use-specific instructions for use***

|  |
| --- |
| - The bait stations should be visited only 5 to 7 days after the beginning of the treatment and at least weekly afterwards, in order to check whether the bait is accepted, the bait stations are intact and to remove rodent bodies. Re-fill bait when necessary. |

***4.8.2 Use-specific risk mitigation measures***

|  |
| --- |
|  |

***4.8.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
|  |

***4.8.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.8.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**4.9. Use description**

**Table 9. Use # 9 – Rats – general public – outdoor around buildings**

|  |  |
| --- | --- |
| **Product Type** | 14 |
| **Where relevant, an exact description of the authorised use** | Not relevant for rodenticides |
| **Target organism(s) (including development stage)** | *Rattus norvegicus* (brown rat)  *Rattus rattus* (black or roof rat) |
| **Field(s) of use** | outdoor around buildings |
| **Application method(s)** | Ready-to-use bait *[in sachets for loose bait]* to be used in tamper-resistant bait stations2. |
| **Application rate(s) and frequency** | Bait products:  - 100 g of bait per bait station. If more than one bait station is needed, the minimum distance between bait stations should be of 5 to 10 meters. |
| **Category(ies) of users** | General public |
| **Pack sizes and packaging material** | FANGA PATE 25 is supplied in heat-sealed paper sachets (5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 g)  Heat-sealed paper sachets are packed in:  - PP/PE bucket (max 150 g)  - Metal box without lacquer (max 150 g)  - PP/PE flacon (max 150 g)  - PE/PP sachets (max 150 g)  - Prefilled tamper resistant PET/PP/PE/PVC bait station.  Maximum packaging size : 150g |

***4.9.1.* *Use-specific instructions for use***

|  |
| --- |
| - Place the bait stations in areas not liable to flooding.  - Replace any bait in a bait station in which bait has been damaged by water or contaminated by dirt.  - The bait stations should be visited only 5 to 7 days after the beginning of the treatment and at least weekly afterwards, in order to check whether the bait is accepted, the bait stations are intact and to remove rodent bodies. Re-fill bait when necessary. |

***4.9.2 Use-specific risk mitigation measures***

|  |
| --- |
|  |

***4.9.3 Where specific to the use, the particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment***

|  |
| --- |
|  |

***4.9.4 Where specific to the use, the instructions for safe disposal of the product and its packaging***

|  |
| --- |
|  |

***4.9.5. Where specific to the use, the conditions of storage and shelf-life of the product under normal conditions of storage***

|  |
| --- |
|  |

**5. General directions for use**

**5.1. Instructions for use6**

|  |
| --- |
| **PROFESSIONAL AND TRAINED PROFESSIONAL USERS**   * Read and follow the product information as well as any information accompanying the product or provided at the point of sale before using it. * Carry out a pre-baiting survey of the infested area and an on-site assessment in order to identify the rodent species, their places of activity and determine the likely cause and the extent of the infestation. * Remove food which is readily attainable for rodents (e.g. spilled grain or food waste). Apart from this, do not clean up the infested area just before the treatment, as this only disturbs the rodent population and makes bait acceptance more difficult to achieve. * The product should only be used as part of an integrated pest management (IPM) system, including, amongst others, hygiene measures and, where possible, physical methods of control. * The product should be placed in the immediate vicinity of places where rodent activity has been previously explored (e.g. travel paths, nesting sites, feedlots, holes, burrows etc.). * Where possible, bait stations must be fixed to the ground or other structures. * Bait stations must be clearly labelled to show they contain rodenticides and that they must not be moved or opened *(see section 5.3 for the information to be shown on the label)*. * *[If national policy or legislation requires it]* When the product is being used in public areas, the areas treated should be marked during the treatment period and a notice explaining the risk of primary or secondary poisoning by the anticoagulant as well as indicating the first measures to be taken in case of poisoning must be made available alongside the baits. * Bait should be secured so that it cannot be dragged away from the bait station. * Place the product out of the reach of children, birds, pets and farm animals and other non-target animals. * Place the product away from food, drink and animal feeding stuffs, as well as from utensils or surfaces that have contact with these. * Wear protective chemical resistant gloves during product handling phase (glove material to be specified by the authorisation holder within the product information). * When using the product do not eat, drink or smoke. Wash hands and directly exposed skin after using the product. * ***FOR TRAINED PROFESSIONAL ONLY****- The* frequency of visits to the treated area should be at the discretion of the operator, in the light of the survey conducted at the outset of the treatment. That frequency should be consistent with the recommendations provided by the relevant code of best practice. * If bait uptake is low relative to the apparent size of the infestation, consider the replacement of bait points to further places and the possibility to change to another bait formulation. * If after a treatment period of 35 days baits are continued to be consumed and no decline in rodent activity can be observed, the likely cause has to be determined. Where other elements have been excluded, it is likely that there are resistant rodent so consider the use of a non-anticoagulant rodenticide, where available, or a more potent anticoagulant rodenticide. Also consider the use of traps as an alternative control measure. * ***FOR PROFESSIONNALS ONLY*** Consider preventive control measures (e.g. plug holes, remove potential food and drinking as far as possible) to improve product intake and reduce the likelihood of reinvasion. * ***FOR PROFESSIONNALS ONLY*** Remove the remaining bait or the bait stations at the end of the treatment period. * Do not open the sachets containing the bait.     **NON PROFESSIONNAL USERS**  - Read and follow the product information as well as any information accompanying the product or provided at the point of sale before using it.  - Prior to the use of rodenticide products, non-chemical control methods (e.g. traps) should be considered.  - Remove food which is readily attainable for rodents (e.g. spilled grain or food waste). Apart from this, do not clean up the infested area just before the treatment, as this only disturbs the rodent population and makes bait acceptance more difficult to achieve.  - Bait stations should be placed in the immediate vicinity where rodent activity has been observed (e.g. travel paths, nesting sites, feedlots, holes, burrows etc.).  - Where possible, bait stations must be fixed to the ground or other structures.  - Do not open the sachets containing the bait  - Place bait stations out of the reach of children, birds, pets, farm animals and other non-target animals.  - Place bait stations away from food, drink and animal feeding stuffs, as well as from utensils or surfaces that have contact with these.  - Do not place bait stations near water drainage systems where they can come into contact with water.  - When using the product do not eat, drink or smoke. Wash hands and directly exposed skin after using the product.  - Remove the remaining bait or the bait stations at the end of the treatment period. |

**5.2. Risk mitigation measures**

|  |
| --- |
| **PROFESSIONAL AND TRAINED PROFESSIONAL USERS**   * Where possible, prior to the treatment inform any possible bystanders about the rodent control campaign [in accordance with the applicable code of good practice, if any]". * The product information (i.e. label and/or leaflet) shall clearly show that the product shall only be supplied to trained professional users holding certification demonstrating compliance with the applicable training requirements (e.g. "for trained professionals only". * ***FOR TRAINED PROFESSIONAL ONLY*** Do not use in areas where resistance to the active substance can be suspected. * Products shall not be used beyond 35 days without an evaluation of the state of the infestation and of the efficacy of the treatment. * ***FOR TRAINED PROFESSIONAL ONLY*** Do not rotate the use of different anticoagulants with comparable or weaker potency for resistance management purposes. For rotational use, consider using a non-anticoagulant rodenticide, if available, or a more potent anticoagulant. * Do not wash the bait stations or utensils used in covered and protected bait points with water between applications. * Dispose dead rodents in accordance with local requirements [The method of disposal shall be described specifically in the national SPC and be reflected on the product label]. * ***FOR PROFESSIONAL ONLY*** To reduce risk of secondary poisoning, search for and remove dead rodents at frequent intervals during treatment (e.g. at least twice a week). [Where relevant, specify if more frequent or daily inspection is required]. * ***FOR PROFESSIONAL ONLY*** Do not use baits containing anticoagulant active substances as permanent baits for the prevention of rodent infestation or monitoring of rodent activities. * ***FOR PROFESSIONAL ONLY. The product information (i.e. label and/or leaflet) shall clearly show that:*** * the product shall not be supplied to the general public (e.g. "for professionals only"). * the product shall be used in adequate tamper resistant bait stations (e.g. "use in tamper resistant bait stations only"). * users shall properly label bait stations with the information referred to in section 5.3 of the SPC (e.g. label bait stations according to the product recommendations"). * ***FOR PROFESSIONAL ONLY :*** Using this product should eliminate rodents within 35 days. The product information (i.e. label and/or leaflet) shall clearly recommend that in case of suspected lack of efficacy by the end of the treatment (i.e. rodent activity is still observed), the user should seek advice from the product supplier or call a pest control service.   **NON PROFESSIONNAL USERS**   * Consider preventive control measures (plug holes, remove potential food and drinking as far as possible) to improve product intake and reduce the likelihood of reinvasion. * Do not use anticoagulant rodenticides as permanent baits (e.g. for prevention of rodent infestation or to detect rodent activity). * The product information (i.e. label and/or leaflet) shall clearly show that: * the product shall be used in adequate tamper resistant bait stations (e.g. "use in tamper resistant bait stations only"). * users shall properly label bait stations with the information referred to in section 5.3 of the SPC (e.g. "label bait stations according to the product recommendations"). * Using this product should eliminate rodents within 35 days. The product information (i.e. label and/or leaflet) shall clearly recommend that in case of suspected lack of efficacy by the end of the treatment (i.e. rodent activity is still observed), the user should seek advice from the product supplier or call a pest control service. * Search for and remove dead rodents during treatment, at least as often as bait stations are inspected. * Dispose dead rodents in accordance with local requirements *[The method of disposal shall be described specifically in the national SPC and be reflected on the product label]*. |

**5.3. Particulars of likely direct or indirect effects, first aid instructions and emergency measures to protect the environment**

|  |
| --- |
| * This product contains an anticoagulant substance. If ingested, symptoms, which may be delayed, may include nosebleed and bleeding gums. In severe cases, there may be bruising and blood present in the faeces or urine. * Antidote: Vitamin K1 administered by medical/veterinary personnel only. * In case of: * Dermal exposure, wash skin with water and then with water and soap. * Eye exposure, rinse eyes with eyes-rinse liquid or water, keep eyes lids open at least 10 minutes. * Oral exposure, rinse mouth carefully with water. Never give anything by mouth to unconscious person. Do not provoke vomiting. If swallowed, seek medical advice immediately and show the product's container or label *[insert* country specific information*]*. Contact a veterinary surgeon in case of ingestion by a pet *[insert* country specific information*]* * Bait stations must be labelled with the following information: "do not move or open"; "contains a rodenticide"; "product name or authorisation number"; "active substance(s)" and "in case of incident, call a poison centre [insert national phone number]" * Hazardous to wildlife. |

**5.4. Instructions for safe disposal of the product and its packaging**

|  |
| --- |
| * At the end of the treatment, dispose the uneaten bait and the packaging in accordance with local requirements [The method of disposal shall be described specifically in the national SPC and be reflected on the product label]. |

**5.5. Conditions of storage and shelf-life of the product under normal conditions of storage**

|  |
| --- |
| * Store in a dry, cool and well ventilated place. Keep the container closed and away from direct sunlight. * Store in places prevented from the access of children, birds, pets and farm animals. * Shelf life: 30 months * Product should not be stroed in metallic packaging |

**6. Other information**

|  |
| --- |
| * Because of their delayed mode of action, anticoagulant rodenticides may take from 4 to 10 days to be effective after effective consumption of the bait. * Rodents can be disease carriers. Do not touch dead rodents with bare hands, use gloves or use tools such as tongs when disposing them.   This product contains a bittering agent and a dye.  (**In France** **only**: The authorisation holder has to monitor the resistance phenomenon of rodent populations toward the active substance brodifacoum. Results of the resistance monitoring must be submitted at the renewal of the product.) |

# Appendices

# Annex 1: List of studies reviewed: List of new datasubmitted in support of the evaluation of the active substance

# *Not applicapble*

# Annex 2: List of studies reviewed: List of new data submitted in support of the evaluation of the biocidal product – PAR 2014, updated 2017

| **Section No** | **Author** | **Year** | **Title** | **Owner of data** | **Letter of Access** | | **Data protection claimed** | | **Essential for the assessment** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Yes** | **No** | **Yes** | **No** |  |
| B3 | Demangel B | 2012 | Physico-chemical tests and chemical stability before and after an accelerated storage procedure for 14 days at 54±2°C on FANGA PATE PRO in compliance with CIPAC MT 46.3 (CIPAC Handbook J -2000). DEFITRACES, Report n° 11-920010-017 of xx January 2012, GLP, unpublished. | TRIPLAN |  |  |  |  | yes |
| B3 | Demangel B | 2012 | Physico-chemical tests and chemical stability before and after an accelerated storage procedure for 14 days at 54±2°C on FANGA PATE PRO in compliance with CIPAC MT 46.3 (CIPAC Handbook J -2000). DEFITRACES, Report n° 11-920010-017 of 12 March 2012, GLP, unpublished. | TRIPLAN |  |  |  |  | yes |
| B3 | Demangel B | 2012 | Physico chemical tests on FANGA PATE PRO DEFITRACES, Report n° 11-920010-016 of the 22 February 2012. GLP, non published | TRIPLAN |  |  |  |  | yes |
| B4 | Ricau H | 2012 | Analytical method validation for the determination of brodifacoum in the FANGA BLOC SP PRO in compliance with SANCO/3030/99 rev.4 from 11/07/00. DEFITRACES, Report n° 11-920010-015 of 23 January 2012, GLP, unpublished | TRIPLAN |  |  |  |  | yes |
| B4 | Ricau H | 2012 | Analytical method validation for the determination of brodifacoum in the FANGA BLOC SP PRO in compliance with SANCO/3030/99 rev.4 from 11/07/00. DEFITRACES, Amended report n° 11-920010-015 of 04 May 2012, GLP, unpublished*.* | TRIPLAN |  |  |  |  | yes |
| B4 | Ricau H | 2012 | Analytical method validation for the determination of brodifacoum in the FANGA PATE PRO in compliance with SANCO/3030/99 rev.4 from 11/07/00. DEFITRACES, Report n° 11-920010-019 of 8 January 2012, GLP, unpublished. | TRIPLAN |  |  |  |  | yes |
| B4 | Ricau H | 2012 | Analytical method validation for the determination of brodifacoum in the FANGA PATE PRO in compliance with SANCO/3030/99 rev.4 from 11/07/00. DEFITRACES, Amended report n° 11-920010-019 of 18 May 2012, GLP, unpublished. | TRIPLAN |  |  |  |  | yes |
| B5 | xxx | 2012 | Palatability of “FANGA PATE PRO” (50 ppm brodifacoum) ready-to-use bait targeting brown rat (*Rattus norvegicus*) and house mouse (*Mus musculus*). xxx | TRIPLAN |  |  |  |  | yes |
| B5 | xxx | 2013 | Study on the palatability and efficacy of a bait containing 0.005% (w/w) brodifacoum in brown rats (*Rattus norvegicus*). xxx | TRIPLAN |  |  |  |  | yes |
| B5 | xxx | 2013 | Study on the palatability and efficacy of a brodifacoum paste bait containing 0.005% in house mouse (*Mus musculus*). xxx | TRIPLAN |  |  |  |  | yes |
| B5 | xxx | 2013 | Evaluation of the efficacy of a paste rodenticide (FANGA PATE PRO) containing 0.005% brodifacoum for the control of brown rat infestations. One trial, 1 site: Rhone, France, 2012-2013. xxx | TRIPLAN |  |  |  |  | yes |
| B5 | xxx | 2013 | Evaluation of the efficacy of a paste rodenticide (FANGA PATE PRO) containing 0.005% brodifacoum for the control of mouse infestation. One trial, 1 site: Rhone, France, 2012-2013. xxx. | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2015 | Efficacy evaluation of BDB10V1 (brodifacoum 0,001% w/w a.i., wheat bait) against Norway rat (Rattus norvegicus Berk.) in Italy, n°xxx. | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2014 | Efficacy evaluation of FANGA B+ RONGEUR (brodifacoum 0.001% w/w a.i., wheat bait) against Roof rat (Rattus rattus L.) in Italy, n°xxx. | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2015 | Study on the palatability and efficacy of a 0.001% w/w Brodifacoum wheat bait in Black Rat (Rattus Rattus), xxx | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2015 | Efficacy evaluation on BDB10V1 (brodifacoum 0.001% w/w a.i., wheat bait) against house mouse (Mus musculus L.) in Italy, xxx | TRIPLAN |  |  |  |  | yes |
| B5 | xxx | 2013 | Study on the palatability and the efficacy of an wheat bait containing 0.001% (w/w) brodifacoum in brown rat (Rattus norvegicus), xxx | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2012 | FANGA BLOC SP PRO evaluation of acute oral toxicity in rats – acute toxic class method. xxx | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2012 | FANGA BLOC SP PRO evaluation of acute dermal toxicity in rats. xxx | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2012 | FANGA BLOC SP PRO assessment of acute dermal irritation. xxx | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2012 | FANGA BLOC SP PRO assessment of acute eye irritation.xxx. | TRIPLAN |  |  |  |  | yes |
| B6 | xxx | 2012 | FANGA BLOC SP PRO assessment of the skin sensitization potential in the mouse using the local lymph node assay (LLNA). xxx | TRIPLAN |  |  |  |  | yes |

# Annex 3: Analytical methods residues – active substance.

Brodifacoum

Date: 25.04.2013

Methods suitable for the determination of residues (monitoring methods)

Extract from document IIA of final CAR of brodifacoum.

Table 47: Analytical methods for the determination of brodifacoum residue

| Sample | **Test substance** | **Analytical method** | **Fortification range / Number of measurements** | **Linearity** | **Specificity** | **Recovery rate (%)** | | | **Limit of determination** | **Reference** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Range | Mean | RSD |
| Soil | *Brodifacoum* | RP-HPLC/DAD (detection at 264 nm) | 0.016÷-0.16 mg/kg in soil, with 4 replicates per level | 0.256÷-12.8 μg/ml (0.006÷-0.32 mg/kg in soil), single determinations at 8 concentrations levels. r2 = 0.9999  No matrix-matched calibration | Not highly specific  LC/MS method for confirmation (only experimental conditions  provided) | 88.5÷-95.4 (overall) | 92.9 (overall) | 2.2 (overall) | LOQ = 0.016 mg/kg in soil  (lowest validated concentration level) | **IIIA4.2 (a)** |
| Drinking water *(natural mineral water Fiuggi)* | *Brodifacoum* | RP-HPLC with MS/MS detection.  Molecular ion (SIM): 521 (m/z), daughter ion (SRM): 187 (m/z)  Quantification by calibration curve, except for spiking level 0.05 μg/l (quantification with the lowest standard calibration level) | 0.05 μg/l (n=5) 0.5 μg/l (n=5) 5.0 μg/l (n=5) 50 μg/l (n=5) | 0.1÷-0.5 μg/ml  (0.05÷-0.25 μg/l in water),  4 determinations at 5 concentration levels  r = 0.995 (SIM mode)  r = 0.997 (SRM mode) | Highly specific | 83.5*÷-*92.0  77.7*÷-*94.1  72.3*÷-*94.6  83.2*÷-*107.7 | 87.8  82.5  81.7  97.8 | 3.8  7.2  9.8  10.6 | LOQ = 0.05 05 μg/l in drinking and ground water;  0.5 μg/l in surface water  (lowest validated concentration level)  LOD = 0.025 μg/l in water | **IIIA4.2 (c)** |
| Ground water  *(Well SB1 I.Pi.Ci)* | 0.05 μg/l (n=5) 0.5 μg/l (n=5) 5.0 μg/l (n=5) 50 μg/l (n=5) | 80.4*÷-*100.6  82.6*÷-*94.4  80.1*÷-*94.6  81.3*÷-*101.2 | 90.5  98.7  87.3  92.5 | 9.3  5.6  7.3  7.0 |
| Surface water *(sampled at Desenzano, Garda lake)* | 0.05 μg/l (n=5) 0.5 μg/l (n=5) 5.0 μg/l (n=5) 50 μg/l (n=5) | 116*÷-*124.3  79.5*÷-*88.0  78.7*÷-*98.6  104.6*÷-*117 | 120.6  84.5  87.3  110.8 | 2.9  4.5  7.8  3.6 |
| Blood serum  (*from Rabbit, lyophilized powder from clotted whole blood)* | *Brodifacoum* | RP-HPLC with MS/MS detection.  Molecular ion (SIM): 523 (m/z), daughter ion (SRM): 187 (m/z)  Quantification by calibration curve at 0.06 mg/l , quantification with the lowest standard calibration level at 0.3 mg/l | 0.06 mg/l (n=5)  0.3 mg/l (n=6) | 0.05-0.40 μg/ml  (0.05-0.40 mg/l in blood serum), 4 determinations at 5 concentration levels  r = 0.99679 (SIM mode)  r = 0.99623 (SRM mode | Highly specific | 80.8-96.6  86.2-109.1 | 92.1  101.7 | 6.5  8.6 | LOQ = 0.06 mg/l (lowest validated concentration level) | **IIIA4.2 (d)(2)** |
| Cucumber | *Brodifacoum* | LC/MS/MS.  Internal standard: Difenacoum  Linear calibration curve for all determinations, except for both spiking levels in lemon and for the validation in meat at 0.1 mg/kg (multi-level calibration standards used)  Brodifacoum  precursor ion 1: 521; product ion 1: 79;  precursor ion 2: 523; product ion 2: 81  *Coumatetralyl*  precursor ion 1: 291; product ion 1: 143; precursor ion 2: 291; product ion 2: 141  Product ion 1 used for measurements | 0.01 mg/kg (n=5)  0.1 mg/kg (n=5) | 0.03-1.2 μg/ml,  2 determinations at 4 concentration levels. Matrix-matched calibration solutions used  r2: 0.9095÷-0.9963 | Highly specific | 82-103  86-106 | 91  94 | 9  9 | LOQ = 0.01 mg/kg in all 5 matrices (lowest validated concentration level) | **IIIA4.3**  **[also IIIA4.2(d)(1) for Meat only]** |
| Wheat | 0.01 mg/kg (n=5)  0.1 mg/kg (n=5) | 88-126  71-90 | 107  84 | 13  9 |
| Meat | 0.01 mg/kg (n=5)  0.1 mg/kg (n=5) | 62-86  45-87 | 73  61 | 13  29 |
| Oil-seed rape | 0.01 mg/kg (n=5)  0.1 mg/kg (n=5) | 75-99  110-134 | 86  119 | 10  8 |
| Lemon | 0.01 mg/kg (n=5)  0.1 mg/kg (n=5) | 74-93  62-89 | 84  76 | 10  13 |

# Annex 4: Toxicology and metabolism –active substance

Brodifacoum

Threshold Limits and other Values for Human Health Risk Assessment

Date: 31/07/2012

| **Summary** | | | |
| --- | --- | --- | --- |
|  | Value | Study | SF |
| AEL long-term | 3.3 x 10-6 mg/kg bw/d | Develomental toxicity study in rats | 300 |
| AEL medium-term | 6.67 x 10-6 mg/kg bw/d | Maternal toxicity from developmental study in rabbits | 300 |
| AEL acute | 3.3 x 10-6 mg/kg bw/d | Reproductive 2-generation study in rats  Reproductive 2-generation study in rats | 300 |
| ADI | 3.3 x 10-6 mg/kg bw/d |
| ARfD | Not applicable |
|  | | | |

|  |  |
| --- | --- |
| Inhalative absorption | 100% |
| Oral absorption | 75% |
| Dermal absorption | 0.047% |

* **Major change application for FANGA PATE 25 – 2018 :**

| **Classification** | |
| --- | --- |
|  |  |
| with regard to toxicological data (according to the criteria in Reg. 1272/2008) | Acute Tox 1 H310  Acute Tox 1 H300  Acute Tox 1 H330  STOT RE Cat 1 H372  Repr. 1A H360D  Repr. 1A; H360D: C ≥ 0,003 %  STOT RE 1; H372: C ≥ 0,02 %  STOT RE 2; H373: 0,002 % ≤ C < 0,02 % |

# Annex 5: Toxicology – biocidal product

FANGA PATE PRO

Date: 31/07/2012

|  |  |
| --- | --- |
| **General information** | |
| Formulation Type | Paste bait |
| Active substance(s) (incl. content) | Brodifacoum (0.005% m/m) |
| Category |  |

| **Acute toxicity, irritancy and skin sensitisation of the preparation (Annex IIIB, point 6.1, 6.2, 6.3)** | | | | |
| --- | --- | --- | --- | --- |
| Rat LD50 oral (OECD 420) | > 2 000 mg/kg bw |  |  |  |
| Rat LD50 dermal (OECD 402) | > 2 000 mg/kg bw |  |  |  |
| Rat LC50 inhalation (OECD 403) | No data submitted |  |  |  |
| Skin irritation (OECD 404) | Non irritant |  |  |  |
| Eye irritation (OECD 405) | Non irritant |  |  |  |
| Skin sensitisation (OECD 429; LLNA) | Non sensitizing |  |  |  |

| **Additional toxicological information (e.g. Annex IIIB, point 6.5, 6.7)** | | | | |
| --- | --- | --- | --- | --- |
| Short-term toxicity studies | None |  |  |  |
| Toxicological data on active substance(s) (not tested with the preparation) | None |  |  |  |
|  |  |  |  |  |
| Toxicological data on non-active substance(s) (not tested with the preparation) | None |  |  |  |
|  |  |  |  |  |
| Further toxicological information | None | | | |

* **Major change application for FANGA PATE 25 – 2018 :**

|  |  |
| --- | --- |
| **Classification and labelling proposed for the preparation with regard to toxicological properties (Annex IIIB, point 9)** | |
| Regulation 1272/2008/EC | STOT RE 2 – H373 |

Annex 6: Safety for professional operators

FANGA PATE PRO

Date: 31/07/2012

**Exposure assessment**

| Exposure scenarios for intended uses (Annex IIIB, point 6.6 ) |
| --- |

Primary exposure of professionals– FANGA PATE PRO (exposure during loading and cleaning considered) – Control of rats

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Component** | **CAS** | **Actual Dermal Total**  **[mg/kg/d]** | **InhalationExposure**  **[mg/m³]** | **Model** |
| **Control of rats and mice** | | | | | |
| Professionnal rat  (without gloves) | Brodifacoum | 56073-10-0 | 2.4x10-6 | Not applicable | CEFICstudy |

Risk assessment– Control of rats and mice

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Scenario** | **Component** | **CAS** | **AEL [mg/kg/d]** | **Absorption**  **[%]** | | **Total syst exposure**  **[mg/kg bw/d]** | | Risk |
| inh | derm | Expo | %AEL |
| **Control of rats and mice** | | | | | | | | |
| Professionnal rat  (without gloves) | Brodifacoum | 56073-10-0 | 3.3x10-6 | 100 | 0.047 | 2.4x10-6 | 72.3 | Acceptable |

* **Major change application for FANGA PATE PRO – 2018 :**

Previous conclusions are remains unchnaged

# Annex 7: Safety for non-professional operators and the general public

FANGA PATE PRO

| General information | |
| --- | --- |
| Formulation Type: | Paste bait |
| Active substance(s) (incl. content): | Brodifacoum (0.005% m/m) |
| Category |  |
| Authorisation number |  |

| **Brodifacoum** |
| --- |

| Data base for exposure estimation | |
| --- | --- |
| according to | Appendix: Toxicology and metabolism – active substance/CAR |

| Exposure scenarios for intended uses (Annex IIIB, point 6.6 ) | |
| --- | --- |
| Primary exposure | Not applicable |
| Secondary exposure, acute | Infant ingesting bait |
| Secondary exposure, chronic | None |

**Conclusion:**

The accidental ingestion of baits poses a risk to infants since the AEL is exceeded when infant ingests more than 0.88 mg of product per day.

* **Major change application for FANGA PATE PRO – 2018 :**

Previous conclusions are remains unchnaged

# Annex 8: Residue behaviour

Brodifacoum

The intended uses description of the product FANGA PATE PRO indicates that these uses are not relevant in terms of residues in food and feed. No further data are required concerning the residue behaviour.

# Annex 9: Efficacy of the active substance from its use in the biocidal product for FANGA PATE PRO

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test substance** | **Test organism(s)** | **Test method** | **Test conditions** | **Test results: effects, mode of action, resistance** | **Reference\*** | **RI** |
| FANGA PATE PRO  0.005% brodifacoum | House mice (*Mus musculus)*  Brown rat *(Rattus norvegicus)* | Laboratory test  House mice: 10 animals (5 males and 5 females)  Brown rat: 10 animals (6 males and 4 females)  Intoxication duration: 20 days with daily measurement of mortality and food consumption. | Acclimation: 7 days in individual cage.  D0-D5: routine food has been given:  40.0 g for rats, 10.0 g for mice.  D5-D20: routine food and tested baits have been given in different feeding dishes.  40.0 g of routine food and 40.0 g of tested baits for rats  10.0 g of routine food and 10.0 g of tested baits for mice.  Food and bait consumption were measured and mortality was observed during 20 days after the first day of intoxication. | For brown rats: Every rat tasted at least very little quantity of the proposed bait since the very first day. Some rats ate large quantities (> 20 g). 2 or 3g was sufficient to kill the rat. Only one rat did not eat bait enough to be killed (0.3 g).  Mean palatability percentage on brown rat = 14.31 %  Mortality percentage on brown rat = 90 %  Efficacy can be considered as satisfying for brown rats.  For house mice: Four mice were still living at the end of the test. In this test, palatability level is overestimated, because it was observed that mice often gnawed the bait and dispersed it in small crumbs, but did not eat all what they took away. This was impossible to measure (a part was mixed with water wheat and urine). This behavior is observed especially when products have a poor palatability.  Mean palatability percentage on house mouse = 8.73 %  Mortality percentage on house mouse = 60 %.  For mice, the studied bait did not appear as palatable enough for obtaining good performance against mice. | IIIB5.10.2 | 3 |
| FANGA PATE PRO  0.005% brodifacoum | Brown rats  *(Rattus norvegicus)* | Laboratory test  Brown rats:  5 males and 5 females.  Intoxication duration: 4 days with daily measurement of mortality and consumption. | Acclimatization: 4 days in individual cage at room temperature.  Day 0: reference food and bait biocidal product have been given:  - 50 g per animal of reference food for the assessment of palatability,  - 50 g per animal of paste bait for the assessment of efficacy  during 4 consecutive days with daily consumption measurements.  Mortality was observed during 21 days every 24 hours. | The FANGA PATE PRO bait containing 50 ppm brodifacoum given to brown rats (5 males and 5 females) during 4 days has demonstrated:   * A palatability equivalent to 0.44 * A good consumption for all rats between day 0 and day 4 * A very good efficacy with a mortality of 90% in a period from day 4 to day 7 | IIIB5.10.2-01 | 1 |
| FANGA PATE PRO  0.005% brodifacoum | House mice  *(Mus musculu*s) | Laboratory test  House mice:  10 males and 10 females.  Intoxication duration: 4 days with daily measurement of mortality and consumption. | Acclimatization: 4 days in separate cages (10 males in a cage and 10 females in a second cage) at room temperature.  Day 0: reference food and bait biocidal product have been given during 4 consecutive days with daily consumption measurements.  Mortality was observed during 21 days every 24 hours or until the death of all animals. | The FANGA PATE PRO bait containing 50 ppm brodifacoum given to house mice (10 males and 10 females) during 4 days has demonstrated:   * A palatability equivalent to 0.65 * A good consumption for all mice between day 0 and day 4 * A very good efficacy with a mortality of 100 % in a period from day 4 to day 9 | IIIB5.10.2-02 | 1 |
| FANGA PATE PRO  0.005% brodifacoum | Brown rats  *(Rattus norvegicus)* | Field test  The rodenticide was evaluated using the census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying rats around the sites. | Acclimatization: 15 days (150-200 g of wheat per station per day)  Treatment : 40 to 160 g of paste bait in each lockable bait station per day (total 10 bait stations) during15 days  Post-baiting: 3 days  (150-200 g of wheat per station per day)  Mortality was observed from the first day of intoxication and noted about every 2 days until the end of the trial. | The FANGA PATE PRO bait containing 50 ppm brodifacoum given to brown rats has demonstrated:  The efficacy was total (100 %).   * Pre-baiting plateau = 531 g/day * Post-baiting = 0 g * Assessed efficacy = 100 %   The assessed bait has been very well accepted by brown rats and effective and the results are consistent with laboratory ones.  No secondary poisoning occurred at the baited site. | IIIB5.10.2-03 | 1 |
| FANGA PATE PRO  0.005% brodifacoum | House mice  *Mus musculus* | Field test:  The rodenticide was evaluated using the census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying mice around the sites. | Acclimatization: 14 days (150-200 g of semolina per station per day)  Treatment : 40 g of paste bait in each lockable bait station (total 10 bait stations) during11 days  Post-baiting: 3 days  (150-200 g of semolina per station per day)  Mortality was observed from the first day of intoxication and noted about every 2 days until the end of the trial. | The FANGA PATE PRO bait containing 50 ppm brodifacoum given to House mice has demonstrated:  The efficacy was total (100 %).   * Pre-baiting plateau = 154 g/day * Post-baiting = 0 g * Assessed efficacy = 100 %   The assessed bait has been very well accepted by House mice and effective and the results are consistent with laboratory ones (100 % efficacy).  No secondary poisoning occurred at the baited site. | IIIB5.10.2-04 | 1 |

* **Major change application and post-authorisation for FANGA PATE PRO - 2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test substance** | **Test organism(s)** | **Test method** | **Test conditions** | **Test results: effects, mode of action, resistance** | **Reference\*** | **RI** |
| FANGA B+  0.001 % brodifacoum | Roof Rat  (*Rattus rattus*) | Field test  The rodenticide was evaluated using the census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying rats around the sites. | Acclimatization: 15 days (200 g of wheat per station per day)  Treatment : 200 g of paste bait in each lockable bait station per day (total 8 bait stations) during15 days  Post-baiting: 6 days  (200 g of wheat per station per day)  Mortality was observed from the first day of intoxication and noted about every day until the end of the trial. | The FANGA B+ bait containing 10 ppm brodifacoum given to black rats has demonstrated:  The efficacy was total (100 %).   * Pre-baiting plateau = 1305 g/day * Post-baiting = 0 g * Assessed efficacy = 100 %   The assessed bait has been very well accepted by brown rats and effective and the results are consistent with laboratory ones. | n° 2008. | 4 |
| FANGA PATE PRO  0.005% brodifacoum  29 months aged | Brown rat  *(Rattus norvegicus)* | Field test  The rodenticide was evaluated using the census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying rats around the sites. | Acclimatization: 15 days (180 g of wheat per station per day)  Treatment : 180 g of paste bait in each lockable bait station per day (total 8 bait stations) during15 days  Post-baiting: 3 days  (180 g of wheat per station per day)  Mortality was observed from the first day of intoxication and noted about every day until the end of the trial. | The FANGA PATE PRO bait containing 50 ppm brodifacoum given to brown rats has demonstrated:  The efficacy was total (100 %).   * Pre-baiting plateau = 1410 g/day * Post-baiting = 0 g * Assessed efficacy = 100 %   The assessed bait has been very well accepted by brown rats and effective and the results are consistent with laboratory ones.  No secondary poisoning occurred at the baited site. | xxx | 1 |
| FANGA PATE PRO  0.005% brodifacoum  29 months aged | Roof rat  *(Rattus rattus)* | Field test  The rodenticide was evaluated using the census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying rats around the sites. | Acclimatization: 15 days (180 g of wheat per station per day)  Treatment : 180 g of paste bait in each lockable bait station per day (total 8 bait stations) during15 days  Post-baiting: 3 days  (180 g of wheat per station per day)  Mortality was observed from the first day of intoxication and noted about every day until the end of the trial. | The FANGA PATE PRO bait containing 50 ppm brodifacoum given to black rats has demonstrated:  The efficacy was total (100 %).   * Pre-baiting plateau = 1320 g/day * Post-baiting = 0 g * Assessed efficacy = 100 %   The assessed bait has been very well accepted by black rats and effective and the results are consistent with laboratory ones.  No secondary poisoning occurred at the baited site. | xxx | 1 |
| FANGA PATE PRO  0.005% brodifacoum  39 months aged | House mouse  *(Mus musculus)* | Field test  The rodenticide was evaluated using the census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying rats around the sites. | Acclimatization: 15 days (30 g of wheat per station per day)  Treatment : 30 g of paste bait in each lockable bait station per day (total 8 bait stations) during15 days  Post-baiting: 3 days  (30 g of wheat per station per day)  Mortality was observed from the first day of intoxication and noted about every day until the end of the trial. | The FANGA PATE PRO bait containing 50 ppm brodifacoum given to house mouse has demonstrated:  The efficacy was total (100 %).   * Pre-baiting plateau = 240 g/day * Post-baiting = 0 g * Assessed efficacy = 100 %   The assessed bait has been very well accepted by house mouse and effective and the results are consistent with laboratory ones.  No secondary poisoning occurred at the baited site. | xxx | 1 |

* **Major change application for FANGA PATE 25 - 2018**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Test substance** | **Test organism(s)** | **Test method** | **Test conditions** | **Test results: effects, mode of action, resistance** | **Reference** | **RI** |
| FANGA B+  (BDPA10V1)  0.001% Brodifacoum | House mice  *Mus musculus*  10 males  10 females | Laboratory test | Acclimatization: 4 days in individual cage at room temperature.  Day 0: reference food and bait biocidal product have been given:  - 50 g per animal of reference food for the assessment of palatability,  - 50 g per animal of biocidal product during 4 consecutive days with daily consumption measurements.  Mortality was observed during 21 days every 24 hours or until the death of all animals. | Palatability = 61%  Mortality = 100 %  in a period from day 3 to day 9 | xxx | 1 |
| FANGA B+  (BDPA10V1)  0.001% Brodifacoum | House mice  *Mus musculus* | Field study  Census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying mice around the sites. | Acclimatization: 14 days (50 g of wheat per station per day)  Treatment: 20 g of bait per day in each lockable bait station – total 14 bait stations) during 14 days  Post-baiting: 3 days  (50 g of wheat per station per day) | Estimated efficacy = 100 %.  Pre-baiting plateau = 155 g/day  Post-baiting = 0 g | xxx | 1 |
| FANGA B+  (BDPA10V1)  0.001% Brodifacoum | Brown rats  *Rattus norvegicus*  5 males  5 females | Laboratory study  Method based on:  Technical Notes for Guidance on Product Evaluation – Product type 14  Brown rat: 10 animals (5 males and 5 females)  Intoxication duration:  4 days with daily measurement of mortality and food consumption | Acclimatization: 4 days in individual cage at room temperature.  Day 0: reference food and bait biocidal product have been given:  - 50 g per animal of reference food for the assessment of palatability,  - 50 g per animal of biocidal product during 4 consecutive days with daily consumption measurements.  Mortality was observed during 21 days every 24 hours or until the death of all animals. | Palatability = 43 %  Mortality = 90 %  in a period from day 4 to day 6 | xxx | 1 |
| FANGA B+  (BDPA10V1)  0.001% Brodifacoum | Brown rats  *Rattus norvegicus* | Field study  Census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying mice around the sites. | Acclimatization: 14 days (200 g of wheat per station per day)  Treatment: 100 g of bait per day in each lockable bait station – total 10 bait stations) during 14 days  Post-baiting: 3 days  (200 g of wheat per station per day) | Estimated efficacy = 100 %  Pre-baiting plateau = 1600 g/day  Post-baiting = 0 g | xxx | 1 |
| FANGA B+  (BDPA10V1)  0.001% Brodifacoum | Black rats  *Rattus rattus* | Field study  EPPO PP Census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying mice around the sites. | Acclimatization: 17 days (200 g of wheat per station per day)  Treatment: 200 g of bait per day in each lockable bait station – total 8 bait stations) during 18 days  Post-baiting: 7 days  (200 g of wheat per station per day) | Estimated efficacy = 100 %  Pre-baiting plateau = 938,3 g/day  Post-baiting = 0 g | xxx | 1 |

* **Minor change application for FANGA PATE 25 – 2018 :**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Experimental data on the efficacy of the biocidal product against target organism(s)** | | | | | | | |
| **Function** | **Field of use envisaged** | **Test substance** | **Test organism(s)** | **Test method** | **Test system / concentrations applied / exposure time** | **Test results: effects** | **Reference** |
| Rodenticide | Indoor, outdoor, open areas, waste dumps and landfills | FANGA B+ (BDPA10V1)  0.001% Brodifacoum  4 years and 1 month aged formulation | Brown rats  *Rattus norvegicus*  Estimated population: 50 - 55 rats | Field study  EPPO PP 1/114(2)  Census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying mice around the sites. | Acclimatization: 15 days (100 g of maize grain per station per day)  Treatment: 100 g of bait per day in each lockable bait station – total 8 bait stations) during 20 days  Post-baiting: 6 days  (100 g of maize grain per station per day) | Estimated efficacy = 100 %  Pre-baiting plateau =800 g/day  Post-baiting = 0 g  R.I. =1 | Rovetto I.  2017  2072.BCD.SAG17 |
| Rodenticide | Indoor, outdoor, open areas, waste dumps and landfills | FANGA B+ (BDPA10V1)  0.001% Brodifacoum  4 years and 1 month aged formulation | Black rats  *Rattus rattus*  Estimated population: 45 - 50 rats | Field study  EPPO PP 1/114(2)  Census baiting technique, which involved the following phases:  Pre-treatment census  Pre-treatment lag phase  Treatment census  Post-treatment lag phase  Post-treatment census  During each assessment the food/bait at each station was weighed and replenished, and the consumption in grams was calculated. During the treatment census, searches were conducted for dead and dying mice around the sites. | Acclimatization: 15 days (100 g of maize grain per station per day)  Treatment: 100 g of bait per day in each lockable bait station – total 8 bait stations) during 17 days  Post-baiting: 6 days  (100 g of maize grain per station per day) | Estimated efficacy = 100 %  Pre-baiting plateau = 627g/day  Post-baiting = 0 g  R.I. =1 | Rovetto I.  2017  2073.BCD.SAG17 |

1. Activa is the applicant of the active substance but not the manufacturer. Tezza SRL is the manufacturer of the active substance as mentioned in the Final CAR of brodifacoum of the Activa / PelGar Brodifacoum Task Force. [↑](#footnote-ref-2)
2. Assessment Report of Brodifacoum, November 2010, Revision 2 (Italy). [↑](#footnote-ref-3)
3. Give also data on test pressure, temperature, pH and concentration range if appropriate. [↑](#footnote-ref-4)
4. Demangel B. 2012, Physico-chemical tests and chemical stability before and after an accelerated storage procedure for 14 days at 54±2°C on FANGA PATE PRO in compliance with CIPAC MT 46.3 (CIPAC Handbook J -2000). DEFITRACES, report n° 11-920010-017 of 12 March 2012, GLP, unpublished. [↑](#footnote-ref-5)
5. Demangel B. 2012. Physico chemical tests on FANGA PATE PRO. DEFITRACES, report n° 11-920010-016 of the 22 February 2012. GLP, unpublished. [↑](#footnote-ref-6)
6. Greaves J. H.; Shepherd D. S.; Gill, J. E. (1982): An investigation of difenacoum resistance in Norway rat populations in Hampshire. *Annals of Applied Biology* 100, 581–587. [↑](#footnote-ref-7)
7. LUND, M. (1984): Resistance to the second generation anticoagulant rodenticides. *In Proceedings of 11th vertebrate pest conference*, Sacramento, Ca. March 6-8, 1984: 89-94. [↑](#footnote-ref-8)
8. Pelz H-J, Ha¨nisch D, Lauenstein G (1995) Resistance to anticoagulant rodenticides in Germany and future strategies to control *Rattus norvegicus. Pestic Sci* 43, 61–67. [↑](#footnote-ref-9)
9. Greaves J. H.; Cullen-Ayres P. B. (1988): Genetics of difenacoum resistance in the rat. In: J. W. Suttie (Ed.), Current advances in vitamin K research, Elsevier, N.Y., 381–388. [↑](#footnote-ref-10)
10. Quy R.J., Shepherd D.S., Inglis I.R. (1992): Bait avoidance and effectiveness of anticoagulant rodenticides against warfarin- and difenacoum-resistant populations of Norway rats (Rattus norvegicus). *Crop Protection*, Volume 11, Issue 1, February 1992, Pages 14-20 [↑](#footnote-ref-11)
11. xxx. (1982): An investigation of difenacoum resistance in Norway rat populations in Hampshire. *xxx* [↑](#footnote-ref-12)
12. xxx. (1984): Resistance to the second generation anticoagulant rodenticides. *x xxx* [↑](#footnote-ref-13)
13. xx (1995) Resistance to anticoagulant rodenticides in Germany and future strategies to control *Rattus norvegicus. xxx* [↑](#footnote-ref-14)
14. xxx (1988): Genetics of difenacoum resistance in the rat. In: J. W. Suttie (Ed.), Current advances in vitamin K x [↑](#footnote-ref-15)
15. xxx. (1992): Bait avoidance and effectiveness of anticoagulant rodenticides against warfarin- and difenacoum-resistant populations of Norway rats (Rattus norvegicus). *xxx* [↑](#footnote-ref-16)
16. Syngenta Limited and Activa / Pelgar Brodifacoum and Difenacoum Task Force Combined Assessment Report according to the procedure of Directive 98/8/EC, active substance in biocidal products, brodifacoum CAS n°56073-10-0, product type 14 (rodenticides), RMS Italy, Revision2: November 2010. [↑](#footnote-ref-17)
17. Although the block weights 10 g and not 20 g as in the CEFIC study, it was considered that the important parameter is the number of blocks loaded rather than the weight of the block [↑](#footnote-ref-18)
18. [↑](#footnote-ref-19)
19. Although the block weights 10 g and not 20 g as in the CEFIC study, it was considered that the important parameter is the number of blocks loaded rather than the weight of the block [↑](#footnote-ref-20)
20. Although the block weights 10 g and not 20 g as in the CEFIC study, it was considered that the important parameter is the number of blocks loaded rather than the weight of the block [↑](#footnote-ref-21)
21. EUBEES 2 - Emission scenario document for biocides used as rodenticides (Larsen, 2003) [↑](#footnote-ref-22)
22. Guidance on the Biocidal Products Regulation, Volume IV Environment - Part B Risk Assessment (active substances), Version 1.0, April 2015 [↑](#footnote-ref-23)
23. If the dead rodents, uneaten bait and bait fragments dragged away from the tamper-resistant bait boxes or covered bait stations are not entirely collected, primary and secondary poisoning risks remain unacceptable. [↑](#footnote-ref-24)
24. See document CA-Nov16-Doc.4.x-Final on the concept of tamper-resistant bait stations. [↑](#footnote-ref-25)
25. See document CA-Nov16-Doc.4.x-Final on the concept of tamper-resistant bait stations. [↑](#footnote-ref-26)
26. See document CA-Nov16-Doc.4.x-Final on the concept of tamper-resistant bait stations. [↑](#footnote-ref-27)