Proposed Registration Decision PRD2026-06

Cholecalciferol, SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK

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Overview

Proposed Registration Decision for cholecalciferol

Health Canada's Pest Management Regulatory Agency (PMRA), pursuant to subsection 28(1) of the *Pest Control Products Act*, is proposing registration for the sale and use of Cholecalciferol Technical, the related end-use products, SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, and TC 413 Rodent Bait, and the related manufacturing concentrate, TC 411 BULK, all containing the active ingredient cholecalciferol, to control rodent pests indoors and outdoors.

An evaluation of available scientific information found that, under the approved conditions of use, the health and environmental risks and the value of the pest control products are acceptable.

This Overview describes the key points of the evaluation, while the Science evaluation provides detailed technical information on the human health, environmental and value assessments of cholecalciferol and related rodenticide products.

What does Health Canada consider when making a registration decision?

The primary objective of the *Pest Control Products Act* is to prevent unacceptable risks to individuals and the environment from the use of pest control products. Health or environmental risk is considered acceptable[1] if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its proposed conditions of registration. The Act also requires that products have value[2] when used according to the label directions. Conditions of registration may include precautionary measures on the product label to further reduce risk.

To reach its decisions, Health Canada's PMRA applies modern, rigorous risk-assessment methods and policies. These methods consider the unique characteristics of sensitive subpopulations in humans (for example, children). They also consider the unique characteristics of organisms in the environment. These methods and policies also consider the nature of the effects observed and the uncertainties when predicting the impact of pesticides. For more information on how Health Canada's PMRA regulates pesticides, the assessment process and risk-reduction programs, please visit the Pesticides and Pest Management portion of Canada.ca.

Before making a final registration decision on cholecalciferol and related rodenticide products, Health Canada's PMRA will consider any written comments received from the public directly related to the proposed decision in this consultation document.[3] Health Canada will then publish

1 "Acceptable risks" as defined by subsection 2(2) of the *Pest Control Products Act.*

2 "Value" as defined by subsection 2(1) of the *Pest Control Products Act*: "the product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's (*a*) efficacy; (*b*) effect on host organisms in connection with which it is intended to be used; and (*c*) health, safety and environmental benefits and social and economic impact."

3 "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*.

a Registration Decision[4] on cholecalciferol and SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK, which will include the decision, the reasons for it, a summary of comments received on the proposed registration decision and Health Canada's response to these comments.

For more details on the information presented in this Overview, please refer to the Science evaluation of this consultation document.

What is cholecalciferol?

Cholecalciferol is a form of vitamin D, also called vitamin D_3, that kills rodents by mobilizing calcium from the bone matrix into the plasma, leading to its subsequent deposition in soft tissues, for example, the kidneys and lungs.

Health considerations

Can approved uses of cholecalciferol affect human health?

Rodenticide products containing cholecalciferol are unlikely to affect your health when used according to proposed label directions.

Potential exposure to cholecalciferol may occur when handling and applying the end-use products. When assessing health risks, two key factors are considered: the levels at which no health effects occur and the levels to which people may be exposed. The dose levels used to assess risks are selected to protect the most sensitive human population (for example, children and nursing mothers). As such, sex and gender are taken into account in the risk assessment. Only uses for which the exposure is well below levels that cause no effects in animal testing are considered acceptable for registration.

Toxicology studies in laboratory animals describe potential health effects from varying levels of exposure to a chemical and identify the dose level at which no effects are observed.

In laboratory animals, the technical grade active ingredient cholecalciferol was of high acute toxicity by the oral and dermal routes of exposure and of moderate acute toxicity via the inhalation route; consequently, the signal word and hazard statement "DANGER – POISON" are required on the label of Cholecalciferol Technical. Cholecalciferol was minimally irritating to the eyes and skin and did not cause an allergic skin reaction.

The acute toxicity of the end-use products and manufacturing concentrate containing cholecalciferol was low via the oral and dermal routes of exposure. They are not expected to pose an acute inhalation hazard. They were minimally irritating to the eyes and non-irritating to the skin and did not cause an allergic skin reaction.

[4] "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act*.

In addition to acute toxicity studies, registrant-supplied short-term animal toxicity tests and genotoxicity testing, as well as information from the published scientific literature, were assessed. The critical effects following oral dosing of cholecalciferol are hypercalcemia and hyperphosphatemia, along with associated changes to the adrenal gland and kidney. Overall, cholecalciferol is not considered to be mutagenic.

The toxicology database for cholecalciferol did not contain the full array of studies normally required for pesticide registration. Rationales to waive additional toxicity testing were accepted based on the known hazard profile of vitamin D, stemming from its importance as an essential vitamin required for normal mammalian growth, as well as the exposure scenarios related to the proposed use pattern of the related end-use products (rodenticides), which have risk mitigation measures in place to reduce exposure. Although there were limited toxicity data available, the supporting toxicological database was considered to be adequate for the current assessment.

Occupational risks from handling SELONTRA RODENT BAIT

Occupational risks are not of health concern when SELONTRA RODENT BAIT is used according to the proposed label directions, which include protective measures.

Occupational handlers using the commercial-class product, SELONTRA RODENT BAIT, and workers entering areas where baits have been placed, are prevented from exposure to cholecalciferol residues through label directions. The label for SELONTRA RODENT BAIT specifies that anyone handling the product must wear a long-sleeved shirt, long pants, shoes, socks, and chemical-resistant gloves when handling this product and disposing of dead rodents, unconsumed bait and empty containers.

Taking into consideration the label statements, the risks to workers from exposure to SELONTRA RODENT BAIT are not of health concern when the end-use product is used according to the proposed label directions.

Health risks in residential and other non-occupational environments

Risks in residential and other non-occupational environments are not of health concern when SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait and TC 413 Rodent Bait are used according to the proposed label directions.

Users handling the domestic-class cholecalciferol products, TC 411 Rodent Bait, TC 412 Rodent Bait and TC 413 Rodent Bait, and individuals entering areas where baits have been placed are prevented from exposure to cholecalciferol residues through label statements. The labels specify that anyone handling bait blocks and/or bait stations, or disposing of rodent carcasses, must wear chemical-resistant gloves. Furthermore, when handling TC 411 Rodent Bait, the protective wrapper must not be removed before loading/refilling bait stations.

Children and pets are prevented from coming into direct contact with cholecalciferol residues from either commercial or domestic class products with label statements indicating that bait must be placed in either tamper resistant bait stations or in locations inaccessible to children and pets. Furthermore, the labels specify that all baits contain a bittering agent to reduce a child repeatedly biting or licking a bait in the unlikely event that any is displaced from a bait station.

Taking into consideration mitigating label statements and restrictive packaging, the use of SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait and TC 413 Rodent Bait is not of health concern when the end-use products are used according to the proposed label directions.

Health risks to bystanders

Bystander risks are not of health concern when SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait and TC 413 Rodent Bait are used according to the proposed label directions.

Bystander exposure is considered not to be applicable, as children and/or pets are not allowed in the area during placement/replacement of the bait and/or bait station.

Health risks to bystanders are not of concern when the end-use products are used according to the proposed label directions.

Environmental considerations

What happens when cholecalciferol is introduced into the environment?

When cholecalciferol is used according to label directions, the risks to the environment have been determined to be acceptable.

Cholecalciferol is a vital nutrient essential for the health of animals. However, when formulated as baits at high concentrations, cholecalciferol can become lethal. These baits are used for rodent control, aiming to reduce rodent populations in various environments.

Cholecalciferol rodenticide bait products are strategically deployed both indoors and outdoors and placed within tamper-resistant bait stations, in covered protected areas or in burrows. They are to be kept out of reach of children, pets, livestock, and non-target wildlife species. By using these protective measures, environmental exposure is minimized. The careful placement of bait stations ensures that the baits remain accessible only to rodents while reducing the risk to other animals. Retrieving/proper disposal of unconsumed baits and dead carcasses will minimize the potential for non-target animals to be poisoned from eating baits or carcasses of animals that died from eating cholecalciferol baits. Based on this, significant environmental exposure is not expected. Therefore, when cholecalciferol baits are used in accordance with label directions, environmental risks are acceptable.

Value considerations

What is the value of SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, and TC 413 Rodent Bait?

These four rodent bait products provide different options for the control of certain rodents with a new mode of action.

SELONTRA RODENT BAIT provides a commercial option to control rats, mice, and meadow voles indoors and outdoors as bulk bait. TC 411 Rodent Bait, TC 412 Rodent Bait, and TC 413 Rodent Bait provide domestic options to control mice (TC 411 Rodent Bait and TC 412 Rodent Bait) or rats (TC 413 Rodent Bait) indoors with either refillable/reusable (TC 411 Rodent Bait) or disposable (TC 412 Rodent Bait and TC 413 Rodent Bait) bait stations.

Measures to minimize risk

Labels of registered pesticide products include specific instructions for use. Directions include risk-reduction measures to protect human health and the environment. These directions must be followed by law.

The key risk-reduction measures being proposed on the labels of Cholecalciferol Technical, SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK to address the potential risks identified in this assessment are as follows.

Key risk-reduction measures

Human health

All risk mitigation measures required in REV2010-17, *Risk Mitigation Measures for Eight Rodenticides*, are reflected in the proposed labels. These and additional proposed mitigation measures are described below for each product.

The commercial-class product, SELONTRA RODENT BAIT, can only be used by certified pest control operators, farmers or persons authorized in government-approved pest control programs. The workers must wear a long-sleeved shirt, long pants, chemical-resistant gloves, shoes and socks when handling the product and disposing of dead rodents, unconsumed bait and empty containers. They must also leave the protective wrapper on the bait block whenever handling it. The wrapped bait must be placed in either a tamper-resistant bait station or in locations not accessible to children, pets, livestock or non-target wildlife. The bait contains a bittering agent.

The domestic-class product, TC 411 Rodent Bait, is a soft bait housed in a refillable bait station resistant to tampering by children. It is a locked, refillable/reusable station where the key must be kept out of the reach of children. The bait blocks are individually wrapped and are not to be unwrapped before or during use. Users must wear chemical-resistant gloves when handling the bait station, bait blocks and rodent carcasses.

The instructions include to not place or refill the bait station when people, pets or livestock are present and not to use this product in areas accessible to pets, domestic animals or non-target wildlife. Unwanted bait and/or damaged bait stations, and carcasses must be wrapped and discarded in household garbage. Damaged bait stations are not to be used. The bait contains a bittering agent.

The domestic-class product, TC 412 Rodent Bait, is packaged in individual disposable bait stations that are resistant to tampering by children. The instructions restrict opening the bait stations. Users must wear chemical-resistant gloves when handling the bait station and rodent carcasses. The instructions include to not place the bait station when pets are present and not to use this product in areas accessible to pets, domestic animals or non-target wildlife. Unwanted bait and/or damaged bait stations, and carcasses must be wrapped and discarded in household garbage. Damaged bait stations are not to be used. The bait contains a bittering agent.

The domestic-class product, TC 413 Rodent Bait, is packaged in individual disposable bait stations that are not tamper-resistant. The instructions restrict opening the bait stations. Users must wear chemical-resistant gloves when handling the bait station and rodent carcasses. The instructions include to not place the bait station when people, pets or livestock are present and not to use this product in areas accessible to children, pets, domestic animals or non-target wildlife. Unwanted bait and/or damaged bait stations, and carcasses must be wrapped and discarded in household garbage. Damaged bait stations are not to be used. The bait contains a bittering agent.

Environment

- For products with outdoor use only: A precautionary statement informing users of the toxicity of cholecalciferol to non-target small wild mammals and birds.
- A disposal statement for animal carcasses to minimize the potential for secondary poisonings of non-target organisms.

Next steps

Before making a final registration decision on cholecalciferol, SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK, Health Canada's PMRA will consider any written comments received from the public that are directly related to this proposed decision, such as comments directed to the Science evaluation, in response to this consultation document up to 30 days from the date of publication (by 26 April 2026) of this document. If more time is required to provide comments, a request for an extension of an additional 15 days can be made. Your request must be submitted in writing to the PMRA's Publications Section (pmra.publications-arla@hc-sc.gc.ca) within the 30-day consultation period. Please forward all comments to PMRA Publications, through the Public Engagement Portal (Public Engagement Portal forms – Consultation Comment). Health Canada will then publish a Registration Decision, which will include its decision, the reasons for it, a summary of comments received on the proposed decision and Health Canada's response to these comments.

Other information

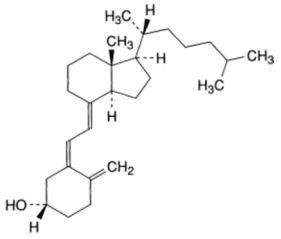
When Health Canada's PMRA makes its registration decision, it will publish a Registration Decision on cholecalciferol, SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK (based on the Science evaluation section of this consultation document). In addition, the test data referenced in this consultation document will be available for public inspection, upon application, in the PMRA's Reading Room. For more information or if you have questions, please contact the PMRA's Pest Management Information Service.

Science evaluation

Cholecalciferol, SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK

1.0 The active ingredient, its properties and uses

1.1 Identity of the active ingredient

Active substance	Cholecalciferol
Function	Rodenticide
Chemical name	
1. International Union of Pure and Applied Chemistry (IUPAC)	(5*Z*,7*E*)-(3*S*)-9,10-secocholesta-5,7,10(19)-trien-3-ol
2. Chemical Abstracts Service (CAS)	(1*S*,3*Z*)-3-[(2*E*)-2-[(1*R*,3a*S*,7a*R*)-1-[(1*R*)-1,5-dimethylhexyl]octahydro-7a-methyl-4*H*-inden-4-ylidene]ethylidene]-4-methylenecyclohexanol
CAS number	67-97-0
Molecular formula	$C_{27}H_{44}O$
Molecular weight	384.64 g/mol
Structural formula	
Purity of the active ingredient	99.5%

1.2 Physical and chemical properties of the active ingredient and end-use products

Technical product – Cholecalciferol Technical

Property	Result
Colour and physical state	White solid
Odour	Odourless
Melting range	84–89°C
Boiling point or range	Not applicable

Property	Result
Density	0.96 g/mL
Vapour pressure at 20°C	4×10^{-5} Pa
Ultraviolet (UV)-visible spectrum	pH λ_{max} (nm) ε (dm^3/mol/cm) 7.0 215 16400 268 18400 1.1 215 16700 268 18600 13.6 268 18400
Solubility in water at 20°C	Practically insoluble in water
Solubility in organic solvents at 20°C	> 250 g/L in n-heptane, xylene, 1,2-dichloroethane, methanol, acetone and ethyl acetate
n-Octanol-water partition coefficient (K_{ow})	log K_{ow} > 5.9
Dissociation constant (pK_a)	Not applicable
Stability (temperature)	The active ingredient is sensitive to air, light and high temperature.

End-use products and manufacturing concentrate – SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK

Property	Result
Colour	Grey-green
Odour	Faintly sweet
Physical state	Solid
Formulation type	Paste
Label concentration	Cholecalciferol at 0.075%
Container material and description	Plastic pail 0.1–10 kg
Density	1.328–1.350 g/cm^3 at 20°C
pH of 1% dispersion in water	6.6
Oxidizing or reducing action	The products do not have oxidizing or reducing action.
Storage stability	The active ingredient was shown to be stable in a long-term study (25°C for 3 years) in a commercial polyethylene (PE) bag and a polypropylene (PP) bucket. The active ingredient was also shown to be stable when stored in a commercial PE bag and a PP bucket at 54°C for 2 weeks.
Corrosion characteristics	The product packaging (PE bag and PP bucket) was shown to be unchanged when stored at 25°C for 3 years; no corrosion was observed. No corrosion was observed in the packaging (PE bag and PP bucket) when the product was stored at 54°C for 2 weeks.
Explodability	The products are not expected to have explosive properties.

1.3 Directions for use

Each of the four bait end-use products is a 0.075% (w/w) soft block formulation of cholecalciferol, which will be available in 20 g or 100 g bait blocks encased in a perforated wrapper. SELONTRA RODENT BAIT is a commercial-class product consisting of 20 g blocks that may be placed in tamper-resistant bait stations or in locations that are not accessible to children, pets, livestock or non-target wildlife. It is proposed for the control of rats, mice, and meadow voles indoors or outdoors within 15 metres of buildings (residential, industrial, commercial, agricultural, and public buildings); or up to 100 m from buildings along fence lines when placed in bait stations securely fastened to the fence or ground. TC 411 Rodent Bait is a domestic class product consisting of a refillable/reusable bait station with 20 g bait blocks for controlling mice indoors. TC 412 Rodent Bait is a domestic class product consisting of a disposable bait station containing one 20 g bait block for the control of mice indoors. TC 413 Rodent Bait is a domestic class product consisting of a disposable bait station containing one 100 g bait block for the control of rats indoors. For mice or voles, 1–2 bait blocks or bait stations (20-40 g bait) are placed every 1–2 m, and for rats, 5–7 bait blocks (100–140 g bait) of SELONTRA RODENT BAIT or 1–2 bait stations (100–200 g bait) of TC 413 Rodent Bait are placed every 5–10 m, depending on the level of rodent activity.

1.4 Mode of action

Cholecalciferol has a novel mode of action compared to other rodenticides currently registered in Canada. It first enters the body via oral ingestion and initially accumulates in the liver. Once the rodent eats a lethal dose, their blood calcium begins to rise to a level that is lethal to the rodent. Cholecalciferol causes hypercalcemia by mobilizing calcium from the bone matrix into the plasma, leading to its subsequent deposition in soft tissues, for example, the kidneys and lungs, ultimately causing death.

2.0 Methods of analysis

2.1 Methods for analysis of the active ingredient

The methods provided for the analysis of the active ingredient and impurities in the technical product have been validated and assessed to be acceptable.

2.2 Method for formulation analysis

The method provided for the analysis of the active ingredient in the formulation has been validated and assessed to be acceptable for use as an enforcement analytical method.

2.3 Methods for residue analysis

High-performance liquid chromatography methods with tandem mass spectrometry (HPLC-MS/MS) were developed and proposed for data generation and enforcement purposes. These methods fulfilled the requirements with regards to selectivity, accuracy and precision at the respective method limit of quantitation. Acceptable recoveries (70–120%) were obtained in environmental media. Methods for residue analysis are summarized in Appendix I, Table 1.

3.0 Impact on human and animal health

3.1 Hazard assessment

3.1.1 Toxicology summary

Cholecalciferol (commonly referred to as vitamin D_3) is a non-anticoagulant rodenticide whose mechanism of action is to mobilize calcium from bones into the blood plasma, causing hypercalcemia, which eventually results in death of rodents. Cholecalciferol is an essential vitamin in humans that helps regulate calcium and phosphorus within the body. It is typically synthesized by the body when exposed to the sun but is also found naturally in food.

A detailed review of the toxicology database for cholecalciferol was conducted. Although the data package for cholecalciferol is limited, the supporting toxicological database is considered to be adequate for the current assessment. The submitted toxicology database consisted of acute toxicity, eye and skin irritation, and dermal sensitization studies, as well as a guideline 90-day oral toxicity study in rats and a battery of genotoxicity studies (including in vitro and in vivo studies) conducted with the active ingredient. A limited non-guideline single oral dose study in rats was also provided. Additionally, waiver rationales were submitted to address requirements for studies assessing toxicokinetics, short-term dermal toxicity, reproductive and prenatal developmental toxicity, and chronic toxicity and carcinogenicity of the active ingredient. Other information submitted included published literature summarizing the results of non-guideline studies in rats and rabbits investigating the reproductive and developmental toxicity of a metabolite of cholecalciferol, 1,25-dihydroxycholecalciferol, also known as calcitriol and the biologically active form of vitamin D, as well as studies investigating proliferative lesions in the rat adrenals induced by both vitamin D_3 and another metabolite, 24R,25-dihydroxyvitamin D.

The technical grade active ingredient cholecalciferol was of high acute toxicity in rats by the oral and dermal routes of exposure and of moderate acute toxicity in rats via the inhalation route. Cholecalciferol was minimally irritating to the eyes and skin of rabbits and was negative for skin sensitization when tested in mice using the local lymph node assay (LLNA).

The end-use products (SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait) and manufacturing concentrate (TC 411 BULK), containing cholecalciferol, were of low acute toxicity via the oral and dermal routes of exposure. They are not expected to pose an acute inhalation hazard based on the physical nature of the products; therefore, a waiver was accepted to satisfy this data requirement. They were minimally irritating to the eyes and non-irritating to the skin of rabbits and were negative for skin sensitization when tested in guinea pigs using the Buehler method.

In a 90-day oral gavage toxicity study in rats, the primary target organ was the kidney in both sexes. Kidney effects included increased incidences of tubular dilatation, mineralization, and degeneration/regeneration, along with chronic-active inflammation and pale foci. Increased incidences of proteinaceous casts in the kidneys were observed only in males. Clinical signs consisting of liquid feces correlating with perianal soiled fur, as well as decreased forelimb grip strength and a decrease in final body weight were observed in males.

Impaired righting reflex was observed in both sexes, although this occurred in males at a lower dose level than in females. Increased serum calcium (hypercalcemia) and serum phosphorus (hyperphosphatemia) levels as well as mineralization of numerous organs was also observed in both sexes, consistent with the mechanism of action of cholecalciferol.

Long-term dosing of rats via gavage, for up to 26 weeks, demonstrated that altered calcium homeostasis from exposure to cholecalciferol leads to proliferative lesions of the adrenal gland in the form of pheochromocytomas as a result of altered chromaffin cell proliferation. These proliferative changes in the rat are attributed to the rat adrenal medulla being unusually susceptible to perturbations of calcium homeostasis when compared to humans.

Cholecalciferol was tested in a battery of genotoxicity studies. Although an increase in DNA damage in the liver of rats was observed in a Comet assay, and a positive result was observed in one of the two bacterial reverse mutation assays, based on the negative results in the remainder of the studies, which included an in vivo micronucleus assay in rats, the overall weight of evidence supports a lack of concern for genotoxic potential.

Published literature studies were provided that investigated the reproductive (rats) and developmental (rats and rabbits) toxicity of a metabolite of cholecalciferol, 1,25-dihydroxycholecalciferol, also called calcitriol. Calcitriol is the active form of cholecalciferol that is synthesized in the liver and kidney and stimulates the intestinal absorption of calcium. Calcitriol formation is under tight metabolic control in humans, and as such, an excess of cholecalciferol will not lead to elevated levels of calcitriol, but rather to an excess of other, less potent metabolites such as calcidiol (PMRA No. 3784705, 3784706). As such, the effects noted in studies conducted with calcitriol are of lower concern to the human health hazard characterization at the dose levels tested.

In the studies with rats dosed with calcitriol, there were no treatment-related effects on measured reproductive or developmental parameters. Hypercalcemia and hypophosphatemia were observed in treated dams and at weaning, pups exhibited hypercalcemia and a slight trend toward increased bone ash. These latter findings paralleled the effects observed in rats following administration of cholecalciferol.

In the study investigating the developmental toxicity of calcitriol in rabbits, an increase in mortality was observed in does at the highest dose level tested, with calcification of the kidneys, lungs and/or stomach observed in animals that died. There were no clear treatment-related effects on developmental parameters in fetuses. Although multiple abnormalities were observed in fetuses from one litter each in the mid- and high-dose group, it was uncertain whether or not the findings could be attributed to compound administration.

Rationales to waive testing requirements for other study types were accepted based on the known hazard profile of vitamin D, stemming from its importance as an essential vitamin required for normal mammalian growth, as well as the exposure scenarios related to the proposed use pattern of the related end-use products (rodenticides) for which risks are mitigated through various means, including label statements, restrictive packaging, and the inclusion of a bittering agent in the product formulations.

Results of the toxicology studies conducted on laboratory animals with cholecalciferol and with its associated end-use products, are summarized in Tables 2 and 3, respectively, of Appendix I.

3.1.2 *Pest Control Products Act* hazard characterization

For assessing risks from potential residues in food or from products used in or around homes or schools, the *Pest Control Products Act* (PCPA) requires the application of an additional 10-fold factor to threshold effects to take into account completeness of the data with respect to the exposure of, and toxicity to, infants and children, and potential prenatal and postnatal toxicity. A different factor may be determined to be appropriate on the basis of reliable scientific data.

Given that there are no dietary uses of the products, the well-established use of vitamin D_3 as a dietary supplement, and the limited exposure anticipated from use of the rodenticide products, characterization of the PCPA factor was not required.

3.2 Toxicology reference values

3.2.1 Route and duration of exposure

Potential exposure to cholecalciferol can be characterized as short- to long-term in duration and by the dermal route for those handling the bait blocks and bait stations and disposing of used bait and bait stations and rodent carcasses. Children could potentially be exposed by the dermal and incidental oral routes if bait is placed in areas accessible to children when not in tamper-resistant stations.

3.2.2 Occupational and residential toxicology reference values

Application and postapplication exposure to cholecalciferol from use of the rodenticide products is expected to be mainly via the dermal route of exposure, and of short-term duration for homeowners and of intermediate- to long-term exposure for licensed pest control operators and authorized personnel. Dietary exposure and exposure via drinking water are not expected.

Toxicology reference values were not required as it was determined that a qualitative approach to the human health risk assessment would be appropriate for cholecalciferol, with risk mitigation measures to reduce exposure, consistent with previous evaluations of rodenticide clusters.

3.2.3 Acute reference dose (ARfD)

Establishment of an acute reference dose was not required as no exposure to the rodenticide products via the diet or drinking water is expected.

3.2.4 Acceptable daily intake (ADI)

Establishment of an acceptable daily intake was not required as no exposure to the rodenticide products via the diet or drinking water is expected.

3.2.5 Cancer assessment

Considering the limited exposure and the qualitative approach taken for the human health risk assessment, a cancer risk assessment was deemed not necessary.

3.2.6 Aggregate toxicology reference values

Aggregate exposure is the total exposure to a single pesticide that may occur from dietary (food and drinking water), residential and other non-occupational sources, and from all known or plausible exposure routes (oral, dermal and inhalation). Considering the limited residential exposure expected from use of the products and the qualitative approach taken for the human health risk assessment, an aggregate assessment was not necessary.

3.3 Dermal absorption

Dermal absorption data were not required as a quantitative risk assessment was not conducted.

3.4 Occupational and residential exposure assessment

3.4.1 Acute hazards of the end-use products and mitigation measures

SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, AND TC 413 Rodent Bait

The acute hazard assessment indicated that SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, AND TC 413 Rodent Bait are of low acute toxicity in rats via the oral and dermal routes of exposure. They are not expected to pose an acute inhalation hazard. They were minimally irritating to the eyes and non-irritating to the skin of rabbits and did not cause an allergic skin reaction in guinea pigs when tested via the Buehler method.

Based on these acute hazards, no additional personal protective equipment (PPE) is triggered for handlers placing bait, loading/refilling bait stations or disposing of unconsumed bait and empty containers. The PPE on the proposed labels is considered acceptable to protect against the acute hazard of SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, AND TC 413 Rodent Bait.

3.4.2 Occupational exposure and risk assessment

The commercial rodenticide product, SELONTRA RODENT BAIT, was reviewed qualitatively and the proposed risk mitigation measures align with the PMRA's risk-reduction strategy for rodenticides (REV2010-17). Any potential dermal exposure to commercial handlers who place bait/bait stations, remove dead rodents, or unwanted bait, are mitigated by formulation type, restrictive packaging and PPE requirements.

Occupational handlers using SELONTRA RODENT BAIT are limited to certified pest control operators, farmers and persons authorized in government-approved pest control programs. According to the label directions, a soft bait block, wrapped in a protective wrapper, is to be placed in a bait station or in an area not accessible to children, pets, livestock or non-target

wildlife. The workers must wear a long-sleeved shirt, long pants, chemical-resistant gloves, socks and shoes when handling the product and disposing of dead rodents, unconsumed bait and empty containers. The protective wrapper is never removed.

The purpose of REV2010-17, *Risk Mitigation Measures for Eight Rodenticides* was to notify registrants, pesticide regulatory officials and the Canadian public that the PMRA was requiring additional risk mitigation measures for rodenticide products as part of an overall risk-reduction strategy for rodenticides in Canada. These measures are to be applied to new active ingredients and end-use products. The measures include specific restrictive packaging and limitations on how and where bait can be placed. All required measures are on the SELONTRA RODENT BAIT label.

3.4.3 Residential exposure and risk assessment

3.4.3.1 Handler exposure and risk assessment

The domestic-class cholecalciferol products, TC 411 Rodent Bait, TC 412 Rodent Bait AND TC 413 Rodent Bait, were reviewed qualitatively and the proposed risk mitigation measures align with the PMRA's risk-reduction strategy for rodenticides (REV2010-17). Any potential dermal exposure to domestic applicators is mitigated by formulation type, restrictive packaging and PPE requirements.

TC 411 Rodent Bait is a soft bait housed in a refillable bait station. The bait is packaged in a perforated wrapper that is not removed prior to placement or loading/refilling bait stations. The label requires that users wear chemical-resistant gloves when handling the bait, refilling the bait stations and when disposing of used bait and bait stations and dead rodents.

TC 412 Rodent Bait and TC 413 Rodent Bait are soft baits housed in single-use disposable bait stations; therefore, handler exposure to the bait is limited. Nevertheless, the label proposes that chemical-resistant gloves be worn when placing the bait station and when disposing of used bait stations and dead rodents.

Taking into consideration the formulation type, restrictive packaging and PPE requirements, there are no health risks of concern when these domestic end-use products are used according to the proposed label directions.

3.4.3.2 Residential postapplication exposure and risk assessment

All 4 end-use products, including the commercial-class product, SELONTRA RODENT BAIT, and the 3 domestic products, TC 411 Rodent Bait, TC 412 Rodent Bait and TC 413 Rodent Bait, were reviewed qualitatively and the proposed risk mitigation measures align with the PMRA's risk-reduction strategy for rodenticides (REV2010-17). Any potential exposures are mitigated by the formulation type, which includes the use of a bittering agent, restrictive packaging and PPE requirements.

All products are placed in a way to minimize exposure to children. SELONTRA RODENT BAIT is placed in either a tamper-resistant bait station or in locations inaccessible to children and pets. TC 411 Rodent Bait and TC 412 Rodent Bait are housed in tamper-resistant bait

stations. TC 413 Rodent Bait is housed in a bait station self-certified by the applicant to be made of material of sufficient rigidity such that the station is not easily crushed or opened by children younger than 6 years old, not easily chewed by rats or mice, and will not release rodenticide bait except for bait removed by target rodents. In addition, the product must only be used in areas inaccessible to children.

The labels specify that anyone handling these products or disposing of rodent carcasses, unconsumed bait and empty containers must wear chemical-resistant gloves. Furthermore, for applicable products, all handlers must not remove the protective wrapper from baits before loading/refilling bait stations.

All baits are formulated with a bittering agent to reduce repeated accidental oral ingestion by a child in the unlikely event bait is displaced from a bait station.

Taking into consideration the placement of the product, the restrictive packaging and bittering agent, there are no health risks of concern when the end-use products are used according to the proposed label directions.

3.4.4 Bystander exposure and risk assessment

Bystander exposure was considered negligible, due to the types of products; in addition, label statements on the domestic products restrict the placement of bait stations while children and/or pets are present.

3.5 Cumulative assessment

The *Pest Control Products Act* requires the PMRA to consider the cumulative effects of pest control products that have a common mammalian mechanism of toxicity for non-occupational (dietary and residential) sources of exposure. Cholecalciferol acts by mobilizing calcium from bones into the blood plasma, causing hypercalcemia. Given that there are no other registered pesticides with the same mechanism of toxicity, a cumulative assessment was not necessary.

3.6 Health incident reports

As of 14 October 2025, 12 domestic animal incidents involving cholecalciferol had been submitted to the PMRA. Two of the incidents occurred in Canada and 10 occurred in the United States.

Ten domestic animal incidents were considered to be at least possibly related to the reported cholecalciferol product. The incidents involved mainly young dogs (in other words, 2 years of age or younger) that were exposed to cholecalciferol bait products that are or were registered in the United States. The exposure scenario reported in the incidents involved the accidental ingestion of cholecalciferol pellet or tablet bait products placed in and around homes.

The details on the circumstances of exposure (for example, how the animals accessed the cholecalciferol products, if the product was placed in tamper-resistant bait stations, or the amount of product ingested) were not reported in most incidents; however 3 incidents specified that pets accessed bait that was left in an individual's pocket, placed in a rodent hole, or placed by a pest control operator in an unknown setting. The severity of the reported effects ranged from minor transient effects (for example, vomiting, lethargy, weakness), to more prolonged effects requiring medical treatment (for example, hypercalcemia), or death (reported in 8 incidents).

Considering the low number of incidents submitted to the PMRA involving cholecalciferol (in other words, 12 incidents from 2007–2025), no additional mitigation measures are recommended.

4.0 Impact on the environment

4.1 Fate and behaviour in the environment

Outdoor uses of cholecalciferol include placement of bait in tamper-resistant weatherproof bait stations, at covered and protected bait points, in burrows within 15 m of buildings; or outside of the 15 m limit along the fence line of properties, but within 100 m of buildings, with tamper-resistant bait stations that are securely fastened (for example, nailed down) to the fence or ground. This strategic placement is crucial, as it minimizes the likelihood of cholecalciferol dispersing into the surrounding environment, particularly the soil.

When considering the soil and aquatic compartment, cholecalciferol exhibits characteristics that mitigate its environmental impact. It is insoluble in water and is not likely to dissociate in an environmentally-relevant pH range. Cholecalciferol is non-persistent in soil due to its propensity to degrade swiftly under aerobic conditions. The estimated log organic carbon-water partition coefficient (log K_{oc}) value of cholecalciferol is indicative of the compound's strong affinity for organic matter within the soil, making it more likely to bind to soil particles rather than dissolve in wet soil. Consequently, this binding reduces the compound's mobility and prevents it from percolating through the soil profile to reach groundwater or to run off into surface water. Therefore, based on use pattern together with its low persistence and immobility in soil, the risk of surface water and groundwater contamination by cholecalciferol is low. These properties also suggest a low potential for bioaccumulation despite cholecalciferol's high octanol-water partition coefficient (log K_{ow}).

In the atmospheric compartment, cholecalciferol is non-volatile under field conditions but the estimated Henry's law Constant indicates that it could be rapidly lost from aqueous solutions or moist surfaces into the air. However, cholecalciferol's strong sorption to soil and its use in weather-resistant bait stations would make this transport route unlikely.

Environmental parameters are summarized in Appendix I, Table 4.

4.2 Environmental risk characterization

An environmental risk assessment was conducted as described in the PMRA guidance document, *Health Canada's Approach to Environmental Risk Assessment for Pest Control Products*, to estimate the potential for adverse effects on non-target species. Environmental exposure and ecotoxicology information were integrated by comparing estimated environmental concentrations (EECs) to the effects-based values used to assess risk (effects metrics). EECs were estimated using standard models that consider application rates and chemical and environmental fate properties, including pesticide dissipation between applications.

Acute and chronic ecotoxicological data for non-target terrestrial and freshwater organisms are summarized in Appendix I, Table 5. In the risk assessment, toxicity endpoints were adjusted via an uncertainty factor (UF) to calculate the effects metrics. The effects metrics account for potential differences in species sensitivity as well as varying protection goals (in other words, protection at the community, population, or individual level). The effects metrics and UFs used in the risk assessment are presented in Appendix I, Table 6.

Initially, a screening-level risk assessment was performed to identify specific uses that do not pose a risk to non-target organisms. The screening-level risk assessment used simple methods, conservative exposure scenarios and sensitive effects metrics. A risk quotient (RQ) was calculated by dividing the EEC by the effects metric and was then compared to the level of concern (LOC). When the screening-level RQ was below the LOC, the risk was considered to be acceptable, and no further risk characterization was necessary.

4.2.1 Risks to terrestrial organisms

In the terrestrial environment, the exposure of invertebrates and vegetation to cholecalciferol is expected to be minimal since cholecalciferol is not expected to leach from baits (in bait stations) and become bioavailable to invertebrates and plants. Under aerobic conditions, cholecalciferol is expected to degrade quickly in soil and bioaccumulation is not anticipated. Therefore, risk characterization to these groups was not assessed.

Non-target birds and mammals (especially those the size of the target pest), can consume the baits, if available, or they can be exposed if they consume the carcasses of animals poisoned by cholecalciferol. Therefore, the risk assessment evaluated risks to birds and mammals consuming cholecalciferol baits directly (in other words, primary exposure), and via the consumption of poisoned carcasses (in other words, secondary exposure).

Risks to birds

Cholecalciferol is non-toxic to birds on an acute oral basis and moderately toxic on an acute dietary basis. The risk assessment used a conservative approach, assuming that the diet of the birds consisted entirely (100%) of bait with the maximum concentration of cholecalciferol (0.075% a.i., equivalent to 750 mg a.i./kg bait). The RQs were below the LOC for acute oral exposure, but exceeded the LOC for acute dietary exposure for birds of all sizes (RQs of 6.8–29.6; Appendix I, Table 6). Birds would need to consume a small proportion of bait in their diet to reach the LOC (3.4–14.8% of the total diet).

However, the use of tamper-resistant weatherproof bait stations and other use restrictions would limit non-target bird exposure. Given that RQs exceed the LOC and a relatively small amount of bait is required to reach the effects metric, a precautionary label statement to inform users of the toxicity to birds is required.

Risks to mammals

Cholecalciferol is toxic to mammals on an acute oral basis. Necropsy showed treatment-related calcification of heart, spleen, kidney and blood vessels indicative of cholecalciferol hypervitaminosis. In the risk assessment, a conservative approach similar to that for birds was used. The calculated screening level RQs of 14.73 to 31.14 based on the acute toxicity data were greater than the LOC (Appendix I, Table 6). The risk was not characterised further based on the use pattern, which includes the use of tamper-resistant weatherproof bait stations and other use restrictions that would limit non-target mammal exposure. A label statement to inform users of the potential toxicity to small wild non-target mammals is required.

Risks to birds and mammals from secondary exposure

Birds and mammals can be exposed to cholecalciferol when they consume poisoned carcasses of rodents. The risk associated with secondary exposure of cholecalciferol (0.075% a.i.) to birds and mammals was assessed based on published literature. In dogs and cats, exposure to poisoned possum carcasses led to toxic symptoms but the animal recovered within 14 days without veterinary intervention once the exposure stopped. Beagle dogs fed Norway rat carcasses containing cholecalciferol survived without any toxic effects. Birds, including red-tailed hawks and turkey vultures, showed no symptoms or mortality when fed rodents contaminated with cholecalciferol bait for 10 consecutive days. Barn owls remained healthy after consuming cholecalciferol-poisoned rats for 7 days and were observed for up to 6 months after the trial stopped. This information shows that cholecalciferol poses a limited secondary poisoning risk to birds and mammals, and where toxic symptoms occurred, the animals were able to recover when the contaminant source was removed. Retrieving and proper disposal of carcasses will further reduce risks to non-target birds and mammals from secondary exposure.

The likelihood of cholecalciferol exposure to non-target birds and mammals (either via direct bait consumption or through secondary exposure) is expected to be low when the products are used according to label directions. The label use directions stipulate that cholecalciferol bait is to be used in tamper-resistant weatherproof bait stations, at covered and protected bait points or in burrows (only occupied by the pest) within 15 m of buildings; or outside of the 15-m limit along the fence line of properties but within 100 m of buildings if it is used in a tamper-resistant bait station that is securely fastened (for example, nailed down) to the fence or ground. The label also requires prompt retrieval and disposal of unconsumed baits and dead carcasses.

4.2.2 Risks to aquatic organisms

Cholecalciferol is primarily used as a rodenticide in terrestrial environments. Its intended application method is within tamper-resistant weatherproof bait stations placed at covered and protected bait points or in burrows where it targets rodent infestation. Due to its non-persistence in soil and immobility, cholecalciferol is not expected to reach the aquatic compartment of the environment. Therefore, direct exposure to aquatic organisms is unlikely.

The applicant submitted a fish study that examined the effect of excess cholecalciferol in the diet on rainbow trout. No significant toxic effects were observed in rainbow trout at the highest test concentrations. Based on the available data, the risk of cholecalciferol to fish is considered acceptable.

4.3 Environmental incident reports

As of 14 October 2025, no environmental incident reports involving cholecalciferol had been submitted to the PMRA.

5.0 Value

Submitted value information included results of 41 efficacy trials (26 laboratory and 15 field trials) conducted in the United Kingdom, France, and Germany, as well as scientific rationales and information on the registration status in other jurisdictions (for example, the products are registered in the United States). The submitted value information is sufficient to support the proposed label claims for SELONTRA RODENT BAIT to control rats, mice, and meadow voles indoors and outdoors, for TC 411 Rodent Bait and TC 412 Rodent Bait to control mice indoors, and for TC 413 Rodent Bait to control rats indoors. Cholecalciferol is a new active ingredient in Canada with a new mode of action. SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait and TC 413 Rodent Bait can be incorporated into Integrated Pest Management programs to help manage rodenticide resistance in these pests.

6.0 Pest Control Product Policy considerations

6.1 Toxic Substances Management Policy considerations

The Toxic Substances Management Policy (TSMP) is a federal government policy developed to provide direction on the management of substances of concern that are released into the environment. The TSMP calls for the virtual elimination of Track 1 substances, in other words, those that meet all four criteria outlined in the policy: persistent (in air, soil, water and/or sediment), bio-accumulative, primarily a result of human activity and toxic as defined by the *Canadian Environmental Protection Act*. *The Pest Control Products Act* requires that the TSMP be given effect in evaluating the risks of a product.

During the review process, cholecalciferol and its end-use products were assessed in accordance with the PMRA Regulatory Directive DIR99-03[5] and evaluated against the Track 1 criteria. The PMRA has reached the conclusion that cholecalciferol does not meet all of the TSMP Track 1 criteria, and it is not expected to form any transformation products that meet all of the TMSP Track 1 criteria.

6.2 Formulants and contaminants of health or environmental concern

During the review process, contaminants in the active ingredient as well as formulants and contaminants in the end-use products are compared against Parts 1 and 3 of the *List of Pest Control Product Formulants and Contaminants of Health or Environmental Concern*.[6] The list is used as described in the PMRA Science Policy Note SPN2020-01[7] and is based on existing policies and regulations, including the *Toxic Substance Management Policy* and *Formulants Policy*,[8] and taking into consideration the *Ozone-depleting Substances and Halocarbon Alternatives Regulations* under the *Canadian Environmental Protection Act, 1999*, (substances designated under the *Montreal Protocol*).

The PMRA has reached the conclusion that cholecalciferol and its end-use products do not contain any formulants or contaminants identified in *the List of Pest Control Product Formulants and Contaminants of Health or Environmental Concern*.

The use of formulants in registered pest control products is assessed on an ongoing basis through PMRA formulant initiatives and Regulatory Directive DIR2006-02.

7.0 Proposed regulatory decision

Health Canada's PMRA, pursuant to subsection 28(1) of the *Pest Control Products Act*, is proposing registration for the sale and use of Cholecalciferol Technical, SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC 412 Rodent Bait, TC 413 Rodent Bait, and TC 411 BULK, containing the active ingredient cholecalciferol, to control rodent pests indoors and outdoors.

An evaluation of available scientific information found that, under the approved conditions of use, the health and environmental risks and the value of the pest control products are acceptable.

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5 DIR99-03, *The Pest Management Regulatory Agency's Strategy for Implementing the Toxic Substances Management Policy*.

6 SI/2005-114, last amended on June 24, 2020. See Justice Laws website, Consolidated Regulations, *List of Pest Control Product Formulants and Contaminants of Health or Environmental Concern.*

7 PMRA's Science Policy Note SPN2020-01, *Policy on the List of Pest Control Product Formulants and Contaminants of Health or Environmental Concern* under paragraph 43(5)(b) of the *Pest Control Products Act*.

8 DIR2006-02, *Formulants Policy and Implementation Guidance Document*.

List of abbreviations

↑	increased
↓	decreased
#	number
♀	female
♂	male
λ	wavelength
ε	molar absorption coefficient
µg	microgram(s)
°C	degrees centigrade
%	percent
a.i.	active ingredient
ADI	acceptable daily intake
ALP	alkaline phosphatase
ALT	alanine aminotransferase
ARfD	acute reference dose
AST	aspartate aminotransferase
atm	atmosphere
bw	body weight
bwg	body weight gain
CAS	Chemical Abstracts Service
cm	centimetres
d	day(s)
DIR	Directive
dm^3	cubic decimeter
DNA	deoxyribonucleic acid
DT_{50}	dissipation time 50% (the time required to observe a 50% decline in concentration)
EDE	estimated daily exposure
EEC	estimated environmental concentration
FIR	food ingestion rate
g	gram(s)
GD	gestation day
HPLC	high performance liquid chromatography
hr	hour(s)
IU	International Units
IUPAC	International Union of Pure and Applied Chemistry
kg	kilogram(s)
K_{oc}	organic-carbon partition coefficient
K_{ow}	*n*–octanol-water partition coefficient
L	litre(s)
LC_{50}	lethal concentration 50%
LD	lactation day
LD_{50}	lethal dose 50%
LLNA	local lymph node assay
LOAEL	lowest observed adverse effect level
LOC	level of concern

log	logarithmic
LOQ	limit of quantitation
m	metre(s)
m^3	cubic metres
MAS	maximum average score
MIS	maximum irritation score
mg	milligram(s)
mL	millilitre
mol	mole
MS	mass spectrometry
nm	nanometres
NOAEL	no observed adverse effect level
NOEC	no observed effect concentration
Pa	Pascal
PCNA	proliferating cell nuclear antigen
PCPA	*Pest Control Product Act*
PE	polyethylene
pK_a	dissociation constant
PMRA	Pest Management Regulatory Agency
PP	polypropylene
PPE	personal protective equipment
ppm	parts per million
RQ	risk quotient
SI	stimulation index
SPN	Science Policy Note
TSMP	Toxic Substances Management Policy
UF	uncertainty factor
UV	ultraviolet
w/w	weight/weight
wk	week(s)
wt	weight

Appendix I Tables

Table 1 Residue analysis in environmental media

Matrix	Analyte	Method type	LOQ	Reference
Sandy loam (LUFA 5M)	Cholecalciferol	HPLC-MS/MS	0.05 ppm	PMRA No. 3442163
Loamy sand (LUFA 2.2)				

Table 2 Toxicity profile of technical cholecalciferol

Effects observed in both sexes are presented first, followed by sex-specific effects in males, then females, each separated by semi-colons. Organ weight effects reflect both absolute organ weights and relative organ to body weights unless otherwise noted. Unless otherwise indicated, studies were conducted with cholecalciferol.

Note: unless otherwise specified, studies listed in this table are considered acceptable according to the PMRA Information Note: Determining Study Acceptability for use in Pesticide Risk Assessments (28 March 2024 (Amended from 2019 version)).

Study type/ Animal/PMRA No.	Study results
Toxicokinetic studies	
Metabolism	Based on the proposed non-food use of the end-use products and the minimal exposure that is anticipated from their use, as well as the abundance of information available in the open literature investigating effects in humans due to the use of cholecalciferol as a vitamin supplement, the requirement for metabolism and toxicokinetic data was waived.
Acute toxicity studies	
Acute Oral Toxicity Sprague Dawley rat PMRA No. 3442118	LD_{50} ♂ = 35 mg/kg bw LD_{50} ♀ = 47 mg/kg bw Clinical signs included decreased motor activity, incoordination, respiration difficulties and muscle weakness. **High acute oral toxicity**
Acute Oral Toxicity Sprague Dawley rat PMRA No. 3442120	LD_{50} ♂ = 352 mg/kg bw LD_{50} ♀ = 619 mg/kg bw Clinical signs included diarrhoea, hypoactivity, emaciation, ataxia, oily yellow or brown stained anal region, red staining around eyes, nose and/or mouth, lacrimation, bradypnoea, dyspnoea, piloerection, and tremors.

Study type/ Animal/PMRA No.	Study results
	High acute oral toxicity
Acute Dermal Toxicity Wistar rat PMRA No. 3442122	LD_{50} ♂ = 61 mg/kg bw LD_{50} ♀ = 185 mg/kg bw Clinical signs included decreased motor activity, incoordination, respiration difficulties and muscle weakness. **High acute dermal toxicity**
Acute Inhalation Toxicity (nose only exposure) Wistar rat PMRA No. 3442124	LC_{50} ♂/♀ = 0.13-0.4 mg/L Clinical signs included effects on motor activity (initially increased up to 24 hrs followed by a decrease), decreased coordination, hunched posture, increased touch response, decreased muscle tone, increased respiratory rate, respiratory difficulties and effects on the autonomic nervous system. **Moderate acute inhalation toxicity**
Primary Eye Irritation New Zealand White rabbit PMRA No. 3442126	MAS (24, 48, 72 hrs) = 0.67/110 MIS = 1.33/110 at 24 hr All eyes were free of irritation by 72 hrs. **Minimally irritating to eyes**
Primary Dermal Irritation New Zealand White rabbit PMRA No. 3442128	The MAS could not be calculated as there was no observation data collected at 48 hrs post-exposure. At 24 hrs, one rabbit exhibited erythema on the treated site (abraded skin). No erythema or edema was observed in non-abraded test areas in all animals. There were no signs of skin irritation by Day 3 (all scores 0 at 72 hrs). **Minimally irritating to the skin**
Dermal Sensitization (LLNA) CBA/J mice PMRA No. 3442130	SI values < 3 There was no mortality, signs of systemic toxicity or local irritation observed in any of the animals. **Not a dermal sensitizer**
Short-term toxicity studies	
90-day Oral Toxicity (gavage) Wistar rats PMRA No. 3442132	**NOAEL (♂/♀) = 0.012 mg/kg bw/day** **LOAEL (♂/♀) = 0.06 mg/kg bw/day** Effects at the LOAEL: ↑ kidney tubular dilatation (♂/♀); ↓ forelimb grip strength, ↓ righting reflex, ↑ trachea mineralization, ↑ kidney tubular degeneration/regeneration, ↑ liquid feces, ↑ perianal soiled fur (♂); ↑ kidney tubular mineralization, ↑ chronic-active kidney inflammation (♀).

Study type/ Animal/PMRA No.	Study results
28-day dermal toxicity Waiver request PMRA No. 3670197	Data requirement waived based on several considerations, including the fact that cholecalciferol (vitamin D_3) is essential for normal mammalian growth, and is used extensively in therapeutics to correct vitamin D deficiency. It is synthesized in human skin by UV radiation from sunlight, and is a natural component of skin, with skin acting as the primary source of vitamin D_3 in humans. Vitamin D_3 analogues are used in dermal ointments for treatment of psoriasis, and safety assessments of these analogues demonstrated that systemic effects observed following dermal application were qualitatively similar to those following oral administration (hypercalcemia, hypercalciuria and ectopic calcification). As a qualitative approach to the human health risk assessment was deemed appropriate for cholecalciferol, with the implementation of risk mitigation measures to reduce exposure, it was determined that a repeat-dose dermal toxicity study in rodents would not be required. Any potential dermal exposure will be mitigated through label statements.
Chronic toxicity/oncogenicity studies	
2-year rat and 18-month mouse Waiver request PMRA No. 3670198	Data requirements were waived based on several considerations, including the fact that cholecalciferol (vitamin D_3) is essential for normal mammalian growth and is used extensively in therapeutics to correct vitamin D deficiency. Additionally, there is evidence suggesting an important role of Vitamin D_3 in the prevention of cancer incidence and mortality. Furthermore, the contribution from rodenticidal use to the total vitamin D exposure is expected to be minimal. The overall weight of evidence suggests a lack of genotoxic potential for cholecalciferol. As a qualitative approach to the human health risk assessment was deemed appropriate for cholecalciferol, with the implementation of risk mitigation measures to reduce exposure, it was determined that chronic toxicity and oncogenicity studies would not be required. Performing guideline chronic toxicity and oncogenicity studies in rodents is not expected to add any further information that would be considered relevant to the human health risk assessment. Any potential dermal or oral exposure will be mitigated through label statements, restrictive packaging, and the inclusion of a bittering agent.
Developmental/Reproductive toxicity studies	
Reproductive/developmental toxicity Waiver request	The document consists of a waiver request with additional weight of evidence considerations to demonstrate that additional developmental and/or reproductive toxicity studies on cholecalciferol are not likely to provide new and regulatorily meaningful data.

Study type/ Animal/PMRA No.	Study results
PMRA No. 3442138	As a qualitative approach to the human health risk assessment was deemed appropriate for cholecalciferol, with the implementation of risk mitigation measures to reduce exposure, it was determined that additional reproductive or developmental toxicity studies would not be required. Performing guideline reproductive and developmental toxicity studies in rodents is not expected to add any further information that would be considered relevant to the human health risk assessment. Any potential dermal or oral exposure will be mitigated through label statements, restrictive packaging, and the inclusion of a bittering agent.
Reproductive toxicity (gavage) Sprague Dawley rat PMRA No. 3442135	**Acceptable with limitations** Study conducted with 1,25-dihydroxycholecalciferol (calcitriol),the active form of vitamin D. Male rats were treated from 60 days prior to mating and through mating. Female rats were treated for 14 days prior to mating, through gestation, delivery and lactation. Half of females were sacrificed on GD 13, uteri examined, implantation sites and corpora lutea counted. Remaining dams allowed to deliver and young were examined for external abnormalities at birth and weaning on LD 21. Necropsy was performed on 1/3rd of each litter. Serum calcium, phosphate and urea nitrogen determined for pups and dams on LD 21. Bone ash determinations of caudal vertebrae and tibia from day 21 pups. NOAEL not established **Maternal toxicity:** **0.08 µg/kg bw/day:** one dam sacrificed moribund (day not specified; had large calculi in bladder and distal end of each ureter) **0.3 µg/kg bw/day:** ↑ serum calcium **Developmental/Offspring toxicity:** Dams sacrificed on GD 13: No significant differences observed between treated and control groups in average viable litter size, # implants, # corpora lutea, or resorption rates. Dams allowed to deliver: No differences in average litter size, gestation index, viability index, lactation index. No effect on pup wt, or any treatment-related fetal external, visceral or skeletal abnormalities. **Limitations:** limited reporting (no individual data), limited parameters evaluated.

Study type/ Animal/PMRA No.	Study results
Developmental toxicity investigation - Effects on early and late fetal development (gavage) Sprague Dawley rat PMRA No. 3442135	**Acceptable with limitations** Study conducted with 1,25-dihydroxycholecalciferol (calcitriol), the active form of vitamin D. To assess effects on early development, females were treated from GD 7 to GD 15 and sacrificed on GD 21 prior to delivery. Caesarean parameters were evaluated (# fetuses, implantation sites, and resorption sites). All fetuses were weighed and examined for external abnormalities; 1/3rd of each litter was examined for visceral abnormalities, 2/3rd were examined for skeletal abnormalities. To assess effects on late fetal development, females were treated from GD 15 through LD 21. Dams were allowed to deliver and rear their young. Neonates were weighed and examined for external abnormalities at birth and a necropsy was performed on 1/3rd of the weanlings on LD 21. Serum calcium, phosphate and urea nitrogen were determined for pups and dams on LD 21. Bone ash was determined for caudal vertebrae and tibiae from day 21 pups. NOAEL not established **Maternal toxicity:** **≥0.08 µg/kg bw/day:** ↑ serum calcium, ↓ serum phosphate **0.30 µg/kg bw/day:** ↑ urea nitrogen No effect on litter size, # resorptions, # implantations **Developmental/Offspring toxicity:** Dams treated GD 7-15 (Effects on early fetal development): **≥0.08 µg/kg bw/day:** ↑ serum calcium No effects on average litter size, fetal bw, resorption rate, no treatment-related external, visceral or skeletal abnormalities. Dams treated GD 15 to LD 21 (Effects on later fetal development): There were no effects on average litter size, # implantations/litter, viability index or lactation index. **Limitations:** limited reporting, no individual data, limited parameters evaluated (not guideline comparable).
Developmental toxicity (gavage) New Zealand White rabbit	**Acceptable with limitations** Study conducted with 1,25-dihydroxycholecalciferol (calcitriol), the active form of vitamin D. Mated females were treated from GD 7 to GD 18 and sacrificed prior to delivery on GD 29. Caesarean parameters

Study type/ Animal/PMRA No.	Study results
PMRA No. 3442135	evaluated (# live/dead fetuses, resorption sites, corpora lutea, implantation sites), fetuses were examined for external abnormalities and weighed. All fetuses sacrificed 24 hrs later and examined for visceral and skeletal abnormalities. Serum calcium, phosphate and urea nitrogen determined for pups and dams on LD 21. Bone ash determinations of caudal vertebrae and tibia from day 21 pups. NOAEL not established **Maternal toxicity:** **0.30 µg/kg bw/day:** ↑ mortality, focal renal tubular calcification, focal calcification of the lungs and stomach, bw loss during treatment period, ↑ resorption rate, ↓ litter size, one doe with severe renal and uterine abnormalities (agenesis of the left kidney, enlarged and abnormal right kidney, agenesis of left uterine horn) **Developmental toxicity:** **≥0.08 µg/kg bw/day:** ↑ # fetuses with external and visceral anomalies. **0.30 µg/kg bw/day:** ↓ viability index **Limitations:** limited reporting (no individual data), limited parameters evaluated.
Genotoxicity studies	
Bacterial reverse mutation assay *S.* typhimurium strains TA100, TA1535, TA1537, and TA98 PMRA No. 3442141	Negative ± metabolic activation Tested up to limit and cytotoxic concentrations.
Bacterial reverse mutation assay *S.*typhimurium strains TA100, TA1535, TA1537, and TA98 *E. coli* strain WP2 uvrA PMRA No. 3442143	Positive under certain conditions TA100: dose-related positive response, + metabolic activation only. TA1535: dose-related positive response, - metabolic activation only. TA98, TA1537, and WP2 uvrA: negative ± metabolic activation when tested up to limit and precipitating concentrations.

Study type/ Animal/PMRA No.	Study results
Mammalian cell chromosome aberration assay (in vitro) V79 cells PMRA No. 3442145	Negative ± metabolic activation Tested up to limit and cytotoxic concentrations.
Mammalian cell mutation, in vitro Mouse lymphoma L5178Y TK cells PMRA No. 3670199	Negative ± metabolic activation Tested up to the limits of solubility and cytotoxicity.
Combined in vivo micronucleus and comet assay (gavage) Han-Wistar rats (♂) PMRA No. 3442147	Cell suspensions were prepared from liver and duodenum and assessed for DNA damage using the Comet assay. Histopathology performed on duodenum and liver. **Micronucleus assay** – Negative **≥7.5 mg/kg bw:** bw loss, altered blood chemistry parameters (↑AST, ↑ ALP, ↓ ALT, ↑ urea, ↑ globulin, ↑ creatinine, ↑ total protein), macroscopic findings in the pancreas (pale), thymus, and thoracic cavity (clear fluid), myositis in duodenum. **15 mg/kg bw:** macroscopic findings in kidneys (pale) and thymus (gelatinous), ↓ inflammatory cell foci in liver. **Comet assay** – Positive **≥7.5 mg/kg bw:** significant ↑ in DNA damage (tail intensity and tail moment) in the liver of animals receiving 7.5 and 15 mg/kg bw/day, with a positive trend test.
Special studies (non-guideline)	
Vitamin D_3-Induced Proliferative Lesions in the rat adrenal medulla (gavage) Sprague Dawley rat PMRA No. 3442155	**Acceptable with limitations** Rats were sacrificed after 4, 8, 12 or 26 wks of treatment, following a final week of BrdU labelling. Adrenal glands, kidneys and a section of duodenum were examined histologically. Blood was analyzed for calcium, phosphorous and creatinine. Adrenal sections were stained for BrdU and phenylethanolamine-N-methyl transferase to discriminate epinephrine from norepinephrine cells or for vesicular acetylcholine transporter to identify cholinergic nerve endings.

Study type/ Animal/PMRA No.	Study results
	The study investigated the relationship between focal proliferative lesions (hyperplasia and pheochromocytomas) in the adrenal medulla and chromaffin cell proliferation and to determine early events in the pathogenesis of these lesions. Results provided further evidence to support the hypothesis that altered calcium homeostasis is indirectly involved in the pathogenesis of pheochromocytomas, via effects on chromaffin cell proliferation. **≥10 000 IU/kg/day:** ↑ adrenal wt, mild nephrocalcinosis in kidney, focal proliferative lesions in the adrenals were observed at 26 wks (hot spots, hyperplastic nodules and adrenal phaeochromocytoma (rare, benign tumour; one in each of mid- and high-dose group). **≥20 000 IU/kg/day:** ↓ bwg at the end of wk 1, moderate nephrocalcinosis in kidneys (foci of calcification and patchy tubular atrophy and scarring). Results provided further evidence to support the hypothesis that altered calcium homeostasis is indirectly involved in the pathogenesis of pheochromocytomas, via effects on chromaffin cell proliferation. **Limitations:** purity not stated, limited examinations.
Influences of long-term administration of 24R,25-dihydroxyvitamin D_3, a vitamin D_3 derivative (intermediate between calcidiol and calcitriol), in rats (diet) Wistar rat PMRA No. 3442157	**Acceptable with limitations** The objective of this study was to assess the adrenal proliferative effect of 24R,25-dihydroxyvitamin D_3 in comparison to its hypercalcaemic qualities. Rats were dosed via the diet for 57 weeks. Influence on cell proliferative activity in the adrenal medulla was evaluated in terms of proliferating cell nuclear antigen (PCNA) expression. **5 ppm:** ↑ serum phosphate, ↑ urinary calcium excretion (wks 3, 22, 56), ↑ urinary phosphate excretion (wk 22), ↑ adrenal wt, ↑ femur wt, ↑ adrenal medullary hyperplasia, phaeochromocytoma (1 rat), thickening of cortical bone in the femurs. ↑ PCNA-labelling indices for intact adrenal medulla, medullary hyperplasia and pheochromocytoma. **Limitations:** only one dose group, limited examinations.
Examination of toxicity and delayed effects after a single oral dose (gavage) Sprague Dawley rats PMRA No. 3442137	**Acceptable with limitations** Rats were dosed once with 0 or 1.5 mg/kg bw/day of cholecalciferol and then examined for 60 days. Long bone growth was assessed on Days 0, 30 and 60 (measurement from tip of extended right forelimb to tip of extended right hindlimb). Weekly bw measurement, serum calcium measurement on Days 0, 30 and 60. Gross necropsy on all animals, examination of right kidney (medullary junction region) for presence of precipitates, histological examination of epiphyseal plate of right femur.

Study type/ Animal/PMRA No.	Study results
	No treatment-related effects on bw, body length, femur length, or calcium content in the serum when measured at intervals up to 60 days post-treatment. No lesions of the distal right femur or associated epiphyseal plate. **Limitations:** only one dose group, limited evaluations.

Table 3 Toxicity profile of the end-use products (SELONTRA RODENT BAIT, TC 411 Rodent Bait, TC412 Rodent Bait, and TC 413 Rodent Bait) and manufacturing concentrate (TC 411 BULK), containing Cholecalciferol Technical (0.075% cholecalciferol)

Study type/ Animal/PMRA #	Study results
Acute Oral Toxicity (Up and Down) Sprague Dawley rat PMRA No. 3442220	LD_{50} ♀ > 5000 mg/kg bw No clinical signs of toxicity. **Low acute oral toxicity**
Acute Dermal Toxicity Wistar rat PMRA No. 3442221	LD_{50} ♂♀ > 5000 mg/kg bw Mild erythema noted at the dose site in four animals on Days 1–2. No other clinical signs of toxicity. **Low acute dermal toxicity**
Acute Inhalation Toxicity (Nose only exposure) Wistar rat PMRA No. 3442222	Waiver request accepted based on the fact that the physical properties of the test material do not permit a mixture with the correct consistency for proper aerosolization to be achieved. The testing laboratory could not achieve a homogenous solution of the test material in any of the solvents tested (water, corn oil, mineral oil, propylene glycol, dimethyl sulphoxide, ethanol, acetone and carboxymethylcellulose). Even after blending and grinding, the mixtures were not uniform and still contained large insoluble particles. The test facility concluded that the physical and chemical properties of the test material prevented the acute inhalation toxicity test from being conducted. It is reasonable to expect that the material is unlikely to aerosolize and that airborne particles are unlikely to be produced when the product is used as intended. **Not expected to pose an acute inhalation hazard.**

Study type/ Animal/PMRA #	Study results
Primary Eye Irritation New Zealand White rabbit PMRA No. 3442223	MAS (24, 48, 72 hrs) = 1.8/110 MIS = 8.7/110 at 1 hr All eyes were free of irritation by 72 hrs. **Minimally irritating to eyes**
Primary Dermal Irritation New Zealand White rabbit PMRA No. 3442224	MAS (24, 48, 72 hrs) = 0/8 MIS = 0/8 **Non-irritating to skin**
Dermal Sensitization (Buehler Method) Guinea pigs PMRA No. 3442225	Negative **Not a dermal sensitizer**

Table 4 Fate and behaviour in the environment

Property	Value	Comments
Water solubility	pH = 7.0 < 0.5 µg/L at 20°C	Practically insoluble
Solubility (g/L) in organic solvents	n-Heptane: >250 Xylene: >250 1,2-dichloroethane: >250 Methanol: >250 Acetone: >250 Ethyl acetate: >250	
Vapour pressure	4×10^{-5} Pa at 20°C, 6×10^{-5} Pa at 25°C	Non-volatile under field conditions
Henry's law Constant	3.037×10^{-4} atm m^3/mole	Slightly volatile from a water surface
log K_{ow}	pH = 6.9; log K_{ow} > 5.9 at 20°C	Potential for bioaccumulation
pK_a	Not likely to dissociate in environmentally relevant pH range.	
UV-visible absorption	Max absorbance at 215 and 268 nm range	Direct phototransformation is unlikely
log K_{oc}	> 5.63	Immobile in soil

Property	Value	Comments
Stability (temperature, metal)	Onset of decomposition at approximately 150°C	The product is compatible with container materials including polyethylene, high density polyethylene, polypropylene, aluminium, steel and stainless steel, as required by United Nations (UN) model transport regulations.
Soil half-life (soil aerobic biotransformation)	DT_{50} = 2.5 to 5.58 d	Non-persistent
Data are from PMRA No. 3442162 unless otherwise noted.		

Table 5 Toxicity to non-target species

Species	Toxicity test	Endpoint value	Toxicity classification[1]	PMRA No.
Terrestrial Organisms				
Birds				
Bobwhite Quail (*Colinus virginianus*)	Acute oral	14-d LD_{50} > 2000 mg/kg bw	Practically non-toxic	3442177
Mallard Duck (*Anas platyrhynchos*)	Acute oral	14-d LD_{50} > 2000 mg/kg bw	Practically non-toxic	3442179
Bobwhite Quail (*Colinus virginianus*)	Acute dietary	5-d LC_{50} = 2000 mg/kg diet (600 mg a.i./kg diet or 64.4 mg a.i./kg bw/day)	Moderately toxic	3442181
Mallard Duck (*Anas platyrhynchos*)	Acute dietary	5-d LC_{50} = 4000 mg/kg diet (1200 mg a.i./kg diet)	Slightly toxic	3442183
Domestic Chicken (*Gallus gallus domesticus*)	Acute oral	1333 mg/kg bw	Slightly toxic	3504103
Mammals				
Sprague-Dawley rat	Acute oral	14-d LD_{50} = 35 mg/kg bw (male), 47 mg/kg bw (female)	Highly toxic	3442118
Sprague-Dawley rat	Acute oral	38-d LD_{50} = 352 mg/kg bw (male), 619 mg/kg bw (female)	Moderately toxic	3442120
Aquatic Organisms				
Rainbow Trout (*Onchorhynchus mykiss*)	Chronic 24 weeks, through the diet	NOEC = 2.6 mg/kg diet[2]	N/A	3442175

[1] USEPA toxicity classification, where applicable. N/A = not applicable

[2] This is a non-standard study that was accepted for qualitative use only.

Table 6 Risk assessment on non-target birds and mammals

Animal Type	Study type	Dose-based endpoint	Toxicity dose (mg a.i./kg bw/day)	Uncertainty factor	Value used for the risk assessment (mg a.i./kg bw/day)	EDE (mg a.i./kg bw/day)[1]	RQ[2]	LOC[3] exceeded
Small-sized bird (20 g)	Acute oral	LD_{50}	2000	10	200	190.45	0.95	No
	Acute dietary		64.4	10	6.44		**29.57**	**Yes**
Medium-sized bird (100 g)	Acute oral	LD_{50}	2000	10	200	149.60	0.75	No
	Acute dietary		64.4	10	6.44		**23.23**	**Yes**
Large-sized bird (1000 g)	Acute oral	LD_{50}	2000	10	200	43.61	0.22	No
	Acute dietary		64.4	10	6.44		**6.77**	**Yes**
Small-sized mammal (0.015 kg)	Acute oral	LD_{50}	35	10	3.5	109	**31.14**	**Yes**
Medium-sized mammal (0.035 kg)	Acute oral	LD_{50}	35	10	3.5	93.64	**26.76**	**Yes**
Large-sized mammal (1 kg)	Acute oral	LD_{50}	35	10	3.5	51.54	**14.73**	**Yes**

[1] Estimated Daily Exposure (EDE) is calculated using the following formula: (FIR/bw) × EEC, where: FIR: Food Ingestion Rate, bw: body weight, and EEC: concentration of the compound in the diet.

Food ingestion rate is based on equations from Nagy (1987):
For generic birds with body weight less than or equal to 200 g, the "passerine" equation was used:
FIR (g dry weight/day) = 0.398(bw in g) $^{0.850}$
For generic birds with body weight greater than 200 g, the "all birds" equation was used:
FIR (g dry weight/day) = 0.648(bw in g) $^{0.651}$
For mammals, the "all mammals" equation was used: FIR (g dry weight/day) = 0.235(bw in g) $^{0.822}$

The EEC was based on the amount of cholecalciferol in the bait (750 mg cholecalciferol/kg bait) and assumes that the diet of each organism is comprised entirely (100%) of the bait.

[2] RQ = Risk Quotient. The RQ is calculated by dividing the EDE by the toxicity endpoint (RQ = EDE/endpoint).

[3] The RQ is compared to the level of concern, LOC = 1.0. RQs in excess of the LOC of 1.0 are bolded.

References

A. List of studies/Information submitted by Registrant

1.0 Chemistry

PMRA Document Number	Reference
3442115	2022, Batch Data, DACO: 2.12.1,2.13.3 CBI
3442116	2013, Cholecalciferol - Physico-Chemical Properties, DACO: 2.14.1,2.14.11,2.14.12,2.14.13,2.14.15,2.14.2,2.14.3,2.14.4,2.14.5,2.14.6,2.14.7, 2.14.8,2.14.9,2.16
3467625	2015, Product Identity, Manufacturing Process, Preliminary Analysis, and Composition of Cholecalciferol, DACO: 2.11.1,2.11.2,2.11.3,2.11.4 CBI
3467626	2018, Product Identity, Manufacturing Process, Preliminary Analysis, and Composition of Cholecalciferol - 2nd Source, DACO: 2.11.1,2.11.2,2.11.3, 2.11.4 CBI
3467627	2018, Cholecalciferol TGAI: Confirmation of Substantial Similarity / Equivalence Between Two Manufacturing Sources Operated by [PRIVACY INFO REMOVED], DACO: 2.11.2,2.11.4 CBI
3467628	2023, Batch Data Confirmation of Identity Cholecalciferol Technical, DACO: 2.13.2 CBI
3545724	2013, Report of Analytical Method Validation for Determination of Related Substances in Cholecalciferol, DACO: 2.13.1 CBI
3545725	2012, Report for Analytical Method Validation of Residual Solvent in Cholecalciferol, DACO: 2.13.1 CBI
3442213	2017, Selontra Method of Manufacture, DACO: 3.2.1,3.2.2,3.3.1 CBI
3442214	2014, Determination of the Total Amount of Cholecalciferol in BAS 410 05 I by UHPLC-(QqQ)MS, DACO: 3.4.1 CBI
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3442218	2013, Evaluation of physical and chemical properties according to Directive 94/37/EC (Regulation (EC) No 440/2008), DACO: 3.5.11,3.5.12,3.5.8 CBI

PMRA Document Number	Reference
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3536863	2015, Physical and Chemical Properties of BAS 410 05 I: Accelerated Storage Stability up to 2 weeks at 54degC of three batches in commercial packs, DACO: 3.5.1,3.5.10,3.5.2,3.5.3,3.5.6,3.5.7 CBI

2.0 Human and animal health

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3442120	1983, Acute oral toxicity (LD_{50}) of Vitamin D_3, DACO: 4.2.1
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3442124	1986, Acute inhalation toxicity of Vitamin D_3 in rats, DACO: 4.2.3
3442126	1982, Primary Irritation of Vitamin D_3 to the rabbit eye, DACO: 4.2.4
3442128	1982, Primary Irritation of Vitamin D_3 to the rabbit skin, DACO: 4.2.5
3442130	2012, Cholecalciferol - Local Lymph Node Assay in the Mouse, DACO: 4.2.6
3442132	2013, Cholecalciferol: A 90-Day Oral (Gavage) Toxicity Study in Wistar Rats, DACO: 4.3.1
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3442137	1983, 60-Day Toxicity Study in Rats, DACO: 4.5.2
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3442143	2013, Cholecalciferol: Bacterial Reverse Mutation Assay, DACO: 4.5.4
3442145	2013, Cholecalciferol: In vitro Mammalian Chromosome Aberration Test, DACO: 4.5.5
3442147	2014, Cholecalciferol: Combined bone marrow micronucleus test and Comet assay in the liver and duodenum in treated rats, DACO: 4.5.7
3442148	2016, Cholecalciferol: Combined bone marrow micronucleus test and Comet assay in the liver and duodenum in treated rats - Amendment to final report, DACO: 4.5.7
3442155	Tischler, A, et. al., 1999, Vitamin D_3-Induced Proliferative Lesions in the Rat Adrenal Medulla, Toxicological Sciences 51, 9-18, DACO: 4.4.1

PMRA Document Number	Reference
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3670198	2024, Response Regarding Genotoxicity and Carcinogenicity Testing for Cholecalciferol, DACO: 4.4.1,4.4.2
3670199	2013, Cholecalciferol: In vitro Mammalian Cell Gene Mutation Test: (Mouse Lymphoma Assay), DACO: 4.5.5
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3442220	2013, Rodenticide Soft Block, BAS 410 05 I: Acute Oral Toxicity Up and Down Procedure in Rate - Limit Test, DACO: 4.6.1
3442221	2013, Rodenticide Soft Block, BAS 410 05 I: Acute Dermal Toxicity Study in Rate - Limit Test, DACO: 4.6.2
3442222	2013, Rodenticide Soft Block, BAS 410 05 I: Acute Inhalation Feasibility Study, DACO: 4.6.3
3442223	2013, Rodenticide Soft Block, BAS 410 05 I: Primary Eye Irritation Study in Rabbits, DACO: 4.6.4
3442224	2013, Rodenticide Soft Block, BAS 410 05 I: Primary Skin Irritation Study in Rabbits, DACO: 4.6.5
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3.0 Environment

PMRA Document Number	Reference
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3442166	2014, Applicant Generated Review of (2012), Cholecalciferol - Validation of an Analytical Method for the Determination in Water, DACO: 8.2.2.3

PMRA Document Number	Reference
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3442173	2013, Justification for non-submission of data - acute toxicity to invertebrates, DACO: 9.3.1,9.3.2
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3442183	1982, 8-day Dietary LC_{50} Study with Chocalciferol Oil Concentrate in Mallard Ducklings, DACO: 9.6.2.5
3442184	2013, Applicant Generated Review of (1982), 8-day Dietary LC_{50} Study with Chocalciferol Oil Concentrate in Mallard Ducklings, DACO: 9.6.2.5
3442187	2023, Applicant Generated Study Review Cholecalciferol Technical - PART 12.7.8 Environmental Chemistry and Fate, DACO: 12.7.8
3442188	2023, Applicant Generated Study Review Cholecalciferol Technical - PART 12.7.9 Environmental Toxicology, DACO: 12.7.9

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4.0 Value

PMRA Document Number	Reference
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PMRA Document Number	Reference
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B. Additional information considered

i) Published information

1.0 Human and animal health

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