

ConsExpo practical: An assessment of the consumer exposure to an insecticide

Case Description

For authorisation of a new pesticide X, the safety of products containing this substance has to be evaluated. The substance is anticipated to be used in three sprays. The specifications of these sprays are presented below.

As part of the authorization process the exposure of the consumer to substance X has to be estimated.

Make a detailed assessment of the exposure for the consumer of these products to substance X. Identify the largest uncertainties in the assessment and indicate in what way the exposure assessment could be improved.

1. Anti-fly spray

Container: spray can.

Weight fraction X: 1.5 %

Weight fraction solvent: 38.5%

Weight fraction propellant: 60%

Use direction:

Use to combat flying insects such as flies, mosquitoes and moths. Close doors and windows of the room. Subsequently, spray from the middle of the room into the four upper corners of the room. Do not spray longer than 1 second per 10 m³ of room volume in total. Keep at least 50 centimetres from walls or objects.

After treatment, keep room closed. After that, ventilate room thoroughly for a while.

2. Anti-flea spray 1:

Container: spray can.

Weight fraction X: 0.1%

Weight fraction solvent: 69.9%

Weight fraction propellant: 30%

Use direction:

Use only against fleas in targeted spot application in corners, cracks and crevices in living areas children in age 0-4 years can not reach. Avoid direct contact with consumption goods.

Close doors and windows of the room. Spray product from several centimetres distance on the spot where fleas and larvae hide. Leave the room after treatment. After half an hour, ventilate the room.

Product is not suited for treating dogs and cats directly

3. Anti-flea spray 2

Container: trigger spray

Weight fraction X : 4g/l, rest: solvent

Use direction:

Use only against crawling insects, such as cockroaches, ants and fleas. Treat the spots where these insects hide. Shake well before use. Spray from a distance of about 1 meter and distribute liquid evenly. The content (1 L) is sufficient to treat an area of 40 m². After 2 weeks, determine whether a second treatment is needed.

Ventilate the room after treatment.

Do not use on animals and plants. Do not use as an airspace application.

Physico-chemical properties X

Vapour pressure: 0.0001 Pa

Molecular weight: 350 g/mol

Log Kow: 2

Exposure assessment

Question 1)

- a) Develop the exposure scenarios:
 - identify exposed population(s)
 - select products relevant for these populations
 - describe how exposure takes place
 - indicate what data are needed to complete the analysis
- b) Make a rough, on-the-back-of-an-envelope estimate of order of magnitude of the exposure.
Determine if, based on your rough estimate, products or routes of exposure can be neglected in the rest of the analysis.

Exercise 2)

Read and follow the steps in the ConsExpo tutorial.

Question 3)

Perform a detailed analysis using the ConsExpo program.

- a) consider first the inhalation route of exposure.
 - i) make an estimate of the exposure base on the provided data. For unavailable data, try to make a reasonable estimate.
 - ii) analyse the uncertainty, consider the following issues:
 - what are the most important uncertainties?
 - for uncertainties in the parameter inputs:
 - o determine the sensitivity of the assessment outcome for changes in the uncertain parameter (perform a sensitivity analysis for parameters, or repeat the calculations with different parameter input values).
 - o try to estimate the range over which the exposure estimate may vary as a result of the combined uncertainties in the parameter values. For example: estimate ranges for the most important uncertain parameters and perform a distributed calculation.
- b) consider the other routes of exposure. Address the same issues as under 2a)