CALENDEX-FCID

Last Revision Date: 08/31/2009

General Information

Model Abbreviated Name: **CALENDEX-FCID**

Model Extended Name: **CALENDEX-FCID**

Model Overview/Abstract:
A major requirement of the 1996 Food Quality and Protection Act (FQPA) is that exposures to pesticides across various pathways and routes (e.g., dermal exposure through turf uses) be appropriately combined such that an "aggregate" exposure assessment can be performed. The Agency currently uses Calendex (TM) - FCID version 2.22 software from Exponent Sciences to perform this aggregation.

Calendex Model, using an approach known as the calendar model, gives scientists the ability to evaluate aggregated exposure that appropriately incorporates the probability of simultaneous exposures across multiple pathways. Calendex can compute exposure estimates that take into account the probability of treatment, probability of contact, timing of exposure, chemical degradation, and magnitude of the exposure. Calendex estimates exposures on each calendar day for the population(s) of concern and permits the exposure analyst to combine the daily exposures to estimate exposures over time periods that appropriately "match" to the available toxicity information.

Keywords:

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User Information

Technical Requirements

Computer Hardware
Windows based operating system.

64 MB RAM, 50 MB free hard disc space, Pentium Class processor or better.

Compatible Operating Systems
Compatible with MS Windows 95, 98, Me, NT4, 2000, and XP

Download Information

Calendex-FCID is a proprietary model that is [available for purchase via an annual licensing agreement with Exponent.](#)

Using the Model

Basic Model Inputs

- Uses the probability that individual exposures occurs around specific dates.
- Calculates exposure for individual chemical uses and exposure routes.
- Combines the exposure-probability distributions for individual uses using Monte Carlo sampling techniques.

Basic Model Outputs

Exposure can be computed and aggregated for the following scenarios:

- product-specific across routes (e.g., turf dermal + turf oral)
- route-specific across products (e.g., turf dermal + pet dermal)
- multiple products and multiple routes (e.g., turf dermal + turf oral + pet dermal + pet oral)

The model output is a population-based exposure distribution using CSFII demographic data.

User Support

User's Guide Available?

Available to Licensed Users.

Model Science

Problem Identification

Calendex permits the estimation of exposure to single or multiple compounds for a wide variety of time periods (daily/acute, short-term, intermediate-term, and chronic (up to one year) time periods). Exposure to chemicals can result from residues in food, residues in or around the residence, and/or residues from occupational uses of the chemical. The route of exposure can result from oral, dermal, or inhalation, or a combination of these routes. Oral exposures may occur via residues in the diet or other pathways such as toddler hand-to-mouth activity.

Summary of Model Structure and Methods

Calendex is designed to permit the inclusion of the <u>temporal</u> aspects of exposure in each assessment. Calendex is designed to permit the inclusion of the <u>spatial</u> aspects of exposure in each assessment. Calendex is designed to permit the user to conduct simple exposure estimates based on point estimates or probabilistic estimates based on distributions and Monte Carlo analysis techniques. The Calendex model can also be used for cumulative exposure assessments as required under FQPA. Cumulative exposures include situations that encompass exposure to more than one chemical, with multiple uses or sources, and multiple exposure routes. Cumulative assessments are conducted for chemicals that have a similar mode of action toxicologically. Cumulative assessment requires that the relative toxicity of the various chemicals included in the analysis be quantitatively specified.

The general exposure model is of the form:

Contact x Residue = Exposure

Calendex specific algorithms can located in the SAP documentation referenced earlier.

Model Evaluation

Calendex has undergone extensive QA/QC testing in order to permit its use for analyses performed according to Good Laboratory Practice (GLP) regulations. The results of some of these QA/QC tests are summarized for the FIFRA Science Advisory Panel (SAP) in a document. The fidelity of the process used to incorporate the data into Calendex has been verified through testing that is also described in this report.