

The comparative risk assessment model consists of 10 files:

- 1) DoseFrequency.msi
- 2) Four files for the exposure assessment model. These include the combinations of slicing location (retail versus plant) and growth inhibitor (GI) use (with versus without GI). All are MS Excel 2007 files.
  - a) DeliMeat6 plant with GI v00.xlsm
  - b) DeliMeat6 plant without GI v00.xlsm
  - c) DeliMeat6 retail with GI v00.xlsm
  - d) DeliMeat6 retail without GI v00.xlsm
- 3) Three files for the dose response model, one for each age group of elderly, intermediate and neonatal. All are MS Excel 2007 files.
  - a) elderly v00.xls
  - b) intermediate v00.xls
  - c) neonatal v00.xls
- 4) The ListeriaMouseLethalityParam.csv file, which should be copied to the folder containing the dose response spreadsheets.
- 5) An optional template file to examine the combined age group results “combined template v01.xlsx”.

The Excel files are the risk assessment model (deli meat exposure pathway). These files are available at: [http://www.fsis.usda.gov/Science/risk\\_assessments/index.asp#RTE](http://www.fsis.usda.gov/Science/risk_assessments/index.asp#RTE)

1. Install the DoseFrequency.msi file. This is a Microsoft installation type file. If you right click on it, you are given the option to install it. Select this option. This step normally only needs to be done once.

Note: The exposure assessments and dose response models (i.e. the Excel files) make extensive use of VBA macros. The security for Excel needs to be set to allow these macros to run. If you are in the default Trust Center / Macro Setting “Disable all macros with notification” mode, you are presented with the Security Warning that reads: “Some active content has been disabled as shown below. Click on “Options...”, then check the box that reads: “Enable this content” and select “Ok”. This step must be taken each time the file is opened.

2. Open any of the exposure assessment spreadsheet and proceed as follows:

	A	B	C	D	E	F	G	H	I	
1	Dose Bins for two-dimensional Monte-Carlo simulation									
2										
3	0	0.0001	0.000316	0.001	0.003162	0.01	0.031623	0.1	0.316228	
4	0.771602	0	0	0	0	0	0	0	0	0.0

### Exposure Assessment models

These steps must be taken for each of the 4 files.

1. On the "Growth" worksheet, the maximum growth in log cfu/g is set as shown in cell B9 through B11 and the cumulative fraction of consumer storage temperature in A20 through A27 with the corresponding time in days shown from B20 through B27 as obtained from the RTI dataset.
2. The "Temperature" worksheet contains 939 set of numbers (consumer storage temperature) as obtained from the RTI data set. The unit of temperature is in °F. The data in this worksheet is not fit to a distribution.
3. The "LMConcModels", "LogGrowthModels" and "Consumption" worksheets remain as they are in the model.
4. On the "Settings" worksheet, the starting concentration leaving the facility (retail or plant depending on the spreadsheet opened), in cfu/g is shown J17 through J26. These need to correspond to I17 through I26, which represents the cumulative fraction of the starting concentration. (e.g. 80% (I18) percentile of product purchased by customers leave the facility with the corresponding starting concentration of Lm contamination shown in J18).
5. Growth rate reduction shown in k14 is a multiplier used based on whether the product contains a growth inhibitor or not.
6. J17 is in-built into the model. It represents the minimum/starting concentration considered by the model. It is normally left at  $10^{-12}$  (1E-12).
7. Once all the data sets specified above are entered appropriately, click "run" on the "ListeriaSim" worksheet. The output should be ready in about 4-8 hours.
8. Repeat this process for all of the exposure assessment spreadsheets.

### Dose response Model

1. Make sure the "ListeriaMouseLethalityParam.csv" file is in the same folder as the dose response workbooks.
2. Each of the age group workbooks contains an appropriate worksheet for the retail/prepackaged with/without growth inhibitor combination for deli meats. The notation uses "AM" (antimicrobial) as a synonym for growth inhibitor
  - a. Deli\_Plant\_With\_AM
  - b. Deli\_Plant\_Without\_AM
  - c. Deli\_Retail\_With\_AM
  - d. Deli\_Retail\_Without\_AM
3. Open each of the exposure assessment workbooks and copy the entire "Output" worksheet A1 through AV305 into the corresponding worksheet in the age dose response workbook. For example, copy the "Output" worksheet A1 through AV305 from "DeliMeat6 plant with GI v00.xlsm" into the "Deli\_Plant\_With\_AM" worksheet in the elderly v00.xlsm workbook. Note that this is a potential area for user error. The outputs from the 4 exposure assessment files must be copied into each of the 3 age files. There are 12 transfers altogether, i.e. the 4 output worksheets from each of the exposure assessment workbooks are each copied into each of the 3 age files.
4. On the "MortalitySim" worksheet, G23 through G26 shows the fraction of deli meats for each of the 4 deli meat categories. The total must be equal to one as shown in cell J23.
5. Also, on the "MortalitySim" worksheet, G28 represents the total deli meat servings per year (This is different for each age group). Meals per annum for a deli meat category for a specific age group (scaling factor) is obtained by multiplying the fraction of deli meat for that category by the total deli meat servings per year for the appropriate age group (e.g. for the elderly, meals per annum for plant with antimicrobial (C23) = fraction of deli meat for plant with antimicrobial (G23) \* total deli meat servings per year for the elderly (G28)).
6. Click "run" on the "Results" worksheet. Please note that I1 should always be "TRUE" which means that the model is being run in a calibrated mode. Also note that E1 is the total number of deaths for all the 26 deli meat categories for that age group. E2 is the number of uncertainty iterations, and normally left at 4000. The model will take several hours to run.
7. When completed, A4 through Z4004 contains the estimated deaths for the given RTE food category and uncertainty run. A4006 through Z4009 contain summary statistics for each food group (the 5<sup>th</sup> percentile, the median, the 95<sup>th</sup> percentile, and the mean respectively) across the 4000 uncertainty iterations. A4011 through Z4012 and 4012 (A-Z) showed the risk ranking across the 26 different food categories. Row 4011 is based on the median, while row 4012 is based on the mean.

### Combined run across all age groups for all deli meat categories (Note: You do not need to enable macros for this file.

1. This step is optional but is needed to estimate the fraction of deaths associated with each category.
2. From each age specific dose response workbook, copy the 4 output columns from the "Results" worksheet to the appropriate columns in the combined template v01.xlsx workbook and deaths worksheet. For example, from the "Results" worksheet of the elderly workbook, copy U5 through X4004 into the cells B11 through E4010 in the "death" worksheet of "combined template v01.xlsx". The column order is designed to match, but the user should confirm. Repeat this for the other age groups. Intermediate results are pasted into G11 through J4010 and neonatal into L11 through O4010.

3. Cells AX2 through BA6 contain the number of servings per age group and slicing location/growth inhibitor combinations. These values are available from each age specific dose response workbook in D23 through D26 of the "Mortality Sim" worksheet.
4. Various summary statistics are calculated in this workbook. Specifically, look at the table in cells AW47 through AZ52, which reports the estimated mean fraction of deaths as a percentage attributed to the 4 different categories. Keep in mind that estimated deaths in this file are for deli meats only, not all 26 RTE food groups.