

DSID-2 Example Calculations

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Introduction and Definition of Terms

The parameter values in Table 1 and Table A1 can be used to apply the regression results for DSID-2 to labeled levels for ingredients in MVM supplement products. Calculations for the following list of terms are defined below:

P% = Predicted Percent Difference from Label

PM = Predicted Mean Amount per Serving

SEM% = Standard Error (SE) of the Predicted Percent Difference from Label (Mean)

SEM = SE for Predicted Mean

SEO% = SE of the Predicted Percent Difference from Label (Individual Observation)

SEO = SE for Predicted Observation

Important Notes

- When performing these calculations, the parameter values must not be rounded. Rounding parameter values will produce inaccurate results.
- The Excel spreadsheet for Table 1 and Table A1 may not display all of the digits for a parameter value. Please click on the individual cell to get the complete value, and do not rely on the cell as displayed.
- E represents "times ten raised to the power of." Therefore, -2.26323E-05 is equivalent to -2.26323×10^{-5}
- DSID reports results to 3 significant digits for PM and P%, and to 2 significant digits for SEM and SEO.

Example Calculations

These example calculations are for a children's multivitamin/mineral supplement with a labeled level of **30 mcg of iodine**. Each parameter is assigned a column letter in this document, so as to make the example calculations easier to read.

1. Calculating Predicted Mean Value

A	B	C
Prediction of the Mean Intercept	Prediction of the Mean Linear	Prediction of the Mean Quadratic
83.345550374135	-1.65537022118001	0.00841305107381694

Predicted Percent Difference from Label (P%)

$$P\% = (\text{Column A}) + [(\text{Column B}) * (\text{Label Amount})] + [(\text{Column C}) * (\text{Label Amount}^2)]$$

$$P\% = (83.345550374135) + [(1.65537022118001) * (30)] + [(0.00841305107381694) * (30^2)] = 41.2562$$

Predicted Mean Amount per Serving (PM)

$$PM = (\text{Label Amount}) * [1 + (P\% / 100)]$$

$$PM = (30) * [1 + (41.2562/100)] = 42.4$$

2. Calculating Standard Error of the Predicted Mean

D	E	F	G	H	I	J	K	L
SE of the Predicted Mean Intercept	SE of the Predicted Mean Linear	SE of the Predicted Mean Quadratic	SE of the Predicted Mean Cubic	SE of the Predicted Mean Quartic	SE of the Predicted Mean Quintic	SE of the Predicted Mean Sextic	SE of the Predicted Mean Septic	SE of the Predicted Mean Octic
16.1138095503568	0.317671550525927	-0.049917659148796	0.00158666366851683	-2.26323427690067E-05	1.61465045574106E-07	-5.02093316443908E-10	0	2.43954418298265E-15

SE of the Predicted Percent Difference from Label for Mean (SEM)

$$\begin{aligned} SEM\% = & (\text{Column D}) + [(\text{Column E}) * (\text{Label Amount})] + [(\text{Column F}) * (\text{Label Amount}^2)] + [(\text{Column G}) * (\text{Label Amount}^3)] \\ & + [(\text{Column H}) * (\text{Label Amount}^4)] + [(\text{Column I}) * (\text{Label Amount}^5)] + [(\text{Column J}) * (\text{Label Amount}^6)] \\ & + [(\text{Column K}) * (\text{Label Amount}^7)] + [(\text{Column L}) * (\text{Label Amount}^8)] \end{aligned}$$

$$\begin{aligned} SEM\% = & (16.1138095503568) + [(0.317671550525927) * (30)] + [(-0.049917659148796) * (30^2)] \\ & + [(0.00158666366851683) * (30^3)] + [(-2.26323427690067E-05) * (30^4)] + [(1.61465045574106E-07) * (30^5)] \\ & + [(-5.02093316443908E-10) * (30^6)] + [0 * (30^7)] + [(2.43954418298265E-15) * (30^8)] = 8.78495984468 \end{aligned}$$

SE for Mean (SEM)

$$SEM = (\text{Label Amount}) * [(SEM\%) / 100]$$

$$SEM = (30) * [(8.78495984468) / 100] = 2.6$$

3. Calculating Standard Error of the Predicted Observation

M	N	O	P	Q	R
SE of the Predicted Observation Intercept	SE of the Predicted Observation Linear	SE of the Predicted Observation Quadratic	SE of the Predicted Observation Cubic	SE of the Predicted Observation Quartic	SE of the Predicted Observation Quintic
34.0887062425593	-0.474473486351915	0.00929411560278674	-7.21444316394268E-05	1.91E-07	0

SE of the Predicted Percent Difference from Label for Individual Observation (SEO%)

$$\text{SEO\%} = (\text{Column M}) + [(\text{Column N}) * (\text{Label Amount})] + [(\text{Column O}) * (\text{Label Amount}^2)] + [(\text{Column P}) * (\text{Label Amount}^3)] + [(\text{Column Q}) * (\text{Label Amount}^4)] + [(\text{Column R}) * (\text{Label Amount}^5)]$$

$$\text{SEO\%} = (34.0887062425593) + [(-0.474473486351915) * (30)] + [(0.00929411560278674) * (30^2)] + [(-7.21444316394268E-05) * (30^3)] + [(1.91215872741346E-07) * (30^4)] = 26.4261908972$$

SE for Predicted Observation (SEO)

$$\text{SEO} = (\text{Label Amount}) * [(\text{SEO\%}) / 100]$$

$$\text{SEO} = (30) * [26.4261908972 / 100] = 7.9$$