|  |
| --- |
| The SAS System |

The GLIMMIX Procedure

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.DIFFERENCE |
| **Response Variable** | diff |
| **Response Distribution** | Shifted T(3) |
| **Link Function** | Identity |
| **Variance Function** | Default |
| **Variance Matrix** | Diagonal |
| **Estimation Technique** | Maximum Likelihood |
| **Degrees of Freedom Method** | Residual |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **mort\_time** | 4 | control early late mort\_tim |
| **mort\_percent** | 7 | 0 10 25 50 75 90 mort\_per |
| **hatch\_interval** | 3 | asynch hatch\_in synch |
| **food\_recolonize\_chance** | 5 | 0.1 0.2 0.5 1 food\_rec |

|  |  |
| --- | --- |
| **Number of Observations Read** | 2201 |
| **Number of Observations Used** | 2200 |

| **Dimensions** | |
| --- | --- |
| **Covariance Parameters** | 2 |
| **Columns in X** | 315 |
| **Columns in Z** | 0 |
| **Subjects (Blocks in V)** | 1 |
| **Max Obs per Subject** | 2200 |

| **Optimization Information** | |
| --- | --- |
| **Optimization Technique** | Newton-Raphson |
| **Parameters in Optimization** | 89 |
| **Lower Boundaries** | 1 |
| **Upper Boundaries** | 0 |
| **Fixed Effects** | Not Profiled |

| **Iteration History** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Iteration** | **Restarts** | **Evaluations** | **Objective Function** | **Change** | **Max Gradient** |
| **0** | **0** | 4 | 10910.045036 | . | 1.951219 |
| **1** | **0** | 6 | 10906.907117 | 3.13791903 | 1.788241 |
| **2** | **0** | 5 | 10891.443564 | 15.46355301 | 1.512728 |
| **3** | **0** | 3 | 10852.524601 | 38.91896258 | 0.613891 |
| **4** | **0** | 3 | 10834.574793 | 17.94980807 | 0.099531 |
| **5** | **0** | 3 | 10832.105782 | 2.46901151 | 0.021073 |
| **6** | **0** | 3 | 10831.96477 | 0.14101142 | 0.00224 |
| **7** | **0** | 3 | 10831.96218 | 0.00259011 | 0.000105 |
| **8** | **0** | 3 | 10831.962089 | 0.00009158 | 7.184E-6 |

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| Convergence criterion (ABSGCONV=0.00001) satisfied. |

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 21663.92 |
| **AIC (smaller is better)** | 21841.92 |
| **AICC (smaller is better)** | 21849.52 |
| **BIC (smaller is better)** | 22348.89 |
| **CAIC (smaller is better)** | 22437.89 |
| **HQIC (smaller is better)** | 22027.17 |
| **Pearson Chi-Square** | 888982.3 |
| **Pearson Chi-Square / DF** | 404.08 |

| **Type III Tests of Fixed Effects** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **mort\_time** | 1 | 2112 | 8072.08 | <.0001 |
| **mort\_percent** | 4 | 2112 | 275947 | <.0001 |
| **mort\_time\*mort\_perce** | 4 | 2112 | 36168.7 | <.0001 |
| **hatch\_interval** | 1 | 2112 | 1053.56 | <.0001 |
| **mort\_time\*hatch\_inte** | 1 | 2112 | 12.68 | 0.0004 |
| **mort\_perc\*hatch\_inte** | 4 | 2112 | 8280.37 | <.0001 |
| **mort\_t\*mort\_p\*hatch\_** | 4 | 2112 | 3830.84 | <.0001 |
| **food\_recolonize\_chan** | 3 | 2112 | 136061 | <.0001 |
| **mort\_time\*food\_recol** | 3 | 2112 | 4596.67 | <.0001 |
| **mort\_perc\*food\_recol** | 12 | 2112 | 51320.7 | <.0001 |
| **mort\_t\*mort\_p\*food\_r** | 12 | 2112 | 3552.01 | <.0001 |
| **hatch\_int\*food\_recol** | 3 | 2112 | 448.92 | <.0001 |
| **mort\_t\*hatch\_\*food\_r** | 3 | 2112 | 50.74 | <.0001 |
| **mort\_p\*hatch\_\*food\_r** | 12 | 2112 | 3913.53 | <.0001 |
| **mort\*mort\*hatc\*food\_** | 12 | 2112 | 1424.82 | <.0001 |

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| The SAS System |

The GLIMMIX Procedure

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.DIFFERENCE |
| **Response Variable** | diff |
| **Response Distribution** | Shifted T(3) |
| **Link Function** | Identity |
| **Variance Function** | Default |
| **Variance Matrix** | Diagonal |
| **Estimation Technique** | Maximum Likelihood |
| **Degrees of Freedom Method** | Residual |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **treatment** | 88 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 |

|  |  |
| --- | --- |
| **Number of Observations Read** | 2201 |
| **Number of Observations Used** | 2200 |

| **Dimensions** | |
| --- | --- |
| **Covariance Parameters** | 2 |
| **Columns in X** | 89 |
| **Columns in Z** | 0 |
| **Subjects (Blocks in V)** | 1 |
| **Max Obs per Subject** | 2200 |

| **Optimization Information** | |
| --- | --- |
| **Optimization Technique** | Newton-Raphson |
| **Parameters in Optimization** | 89 |
| **Lower Boundaries** | 1 |
| **Upper Boundaries** | 0 |
| **Fixed Effects** | Not Profiled |

| **Iteration History** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Iteration** | **Restarts** | **Evaluations** | **Objective Function** | **Change** | **Max Gradient** |
| **0** | **0** | 4 | 10910.045036 | . | 1.951219 |
| **1** | **0** | 7 | 10907.250867 | 2.79416899 | 1.856196 |
| **2** | **0** | 7 | 10849.308202 | 57.94266493 | 0.384312 |
| **3** | **0** | 3 | 10834.084548 | 15.22365396 | 0.091483 |
| **4** | **0** | 3 | 10832.056258 | 2.02829049 | 0.017778 |
| **5** | **0** | 3 | 10831.962987 | 0.09327038 | 0.001632 |
| **6** | **0** | 3 | 10831.962088 | 0.00089897 | 0.000064 |
| **7** | **0** | 3 | 10831.962085 | 0.00000318 | 1.207E-6 |

|  |
| --- |
| Convergence criterion (GCONV=1E-8) satisfied. |

| **Fit Statistics** | |
| --- | --- |
| **-2 Log Likelihood** | 21663.92 |
| **AIC (smaller is better)** | 21841.92 |
| **AICC (smaller is better)** | 21849.52 |
| **BIC (smaller is better)** | 22348.89 |
| **CAIC (smaller is better)** | 22437.89 |
| **HQIC (smaller is better)** | 22027.17 |
| **Pearson Chi-Square** | 888982.5 |
| **Pearson Chi-Square / DF** | 404.08 |

| **Type III Tests of Fixed Effects** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **treatment** | 87 | 2112 | 32592.3 | <.0001 |

| **Estimates** | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Label** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **frc=10 asynch 10% early** | 19.2929 | 5.8158 | 2112 | 3.32 | 0.0009 |
| **frc=10 asynch 25% early** | 48.0967 | 5.5651 | 2112 | 8.64 | <.0001 |
| **frc=10 asynch 50% early** | 100.82 | 5.9933 | 2112 | 16.82 | <.0001 |
| **frc=10 asynch 75% early** | -349.73 | 6.1781 | 2112 | -56.61 | <.0001 |
| **frc=10 asynch 90% early** | -419.28 | 5.4461 | 2112 | -76.99 | <.0001 |
| **frc=10 asynch 10% late** | -17.7109 | 5.7881 | 2112 | -3.06 | 0.0022 |
| **frc=10 asynch 25% late** | -49.3017 | 5.6367 | 2112 | -8.75 | <.0001 |
| **frc=10 asynch 50% late** | -109.37 | 5.7586 | 2112 | -18.99 | <.0001 |
| **frc=10 asynch 75% late** | -153.17 | 5.7511 | 2112 | -26.63 | <.0001 |
| **frc=10 asynch 90% late** | -191.24 | 5.6549 | 2112 | -33.82 | <.0001 |
| **frc=10 synch 10% early** | 83.3380 | 9.2090 | 2112 | 9.05 | <.0001 |
| **frc=10 synch 25% early** | 157.17 | 8.2974 | 2112 | 18.94 | <.0001 |
| **frc=10 synch 50% early** | 127.48 | 8.3652 | 2112 | 15.24 | <.0001 |
| **frc=10 synch 75% early** | -390.68 | 7.4302 | 2112 | -52.58 | <.0001 |
| **frc=10 synch 90% early** | -469.36 | 8.0223 | 2112 | -58.51 | <.0001 |
| **frc=10 synch 10% late** | -7.6963 | 8.9124 | 2112 | -0.86 | 0.3879 |
| **frc=10 synch 25% late** | -15.4555 | 8.2017 | 2112 | -1.88 | 0.0596 |
| **frc=10 synch 50% late** | -69.2192 | 8.4537 | 2112 | -8.19 | <.0001 |
| **frc=10 synch 75% late** | -115.77 | 7.5289 | 2112 | -15.38 | <.0001 |
| **frc=10 synch 90% late** | -189.54 | 7.7561 | 2112 | -24.44 | <.0001 |
| **frc=20 asynch 10% early** | 20.9114 | 6.7887 | 2112 | 3.08 | 0.0021 |
| **frc=20 asynch 25% early** | 92.4579 | 6.1236 | 2112 | 15.10 | <.0001 |
| **frc=20 asynch 50% early** | 179.85 | 6.5394 | 2112 | 27.50 | <.0001 |
| **frc=20 asynch 75% early** | -701.68 | 7.0061 | 2112 | -100.15 | <.0001 |
| **frc=20 asynch 90% early** | -830.92 | 6.0742 | 2112 | -136.79 | <.0001 |
| **frc=20 asynch 10% late** | -33.0149 | 6.1179 | 2112 | -5.40 | <.0001 |
| **frc=20 asynch 25% late** | -97.0666 | 6.1637 | 2112 | -15.75 | <.0001 |
| **frc=20 asynch 50% late** | -226.65 | 6.4448 | 2112 | -35.17 | <.0001 |
| **frc=20 asynch 75% late** | -376.32 | 6.0371 | 2112 | -62.34 | <.0001 |
| **frc=20 asynch 90% late** | -467.90 | 6.2980 | 2112 | -74.29 | <.0001 |
| **frc=20 synch 10% early** | 71.6799 | 7.4819 | 2112 | 9.58 | <.0001 |
| **frc=20 synch 25% early** | 197.39 | 6.5938 | 2112 | 29.94 | <.0001 |
| **frc=20 synch 50% early** | 140.18 | 7.5436 | 2112 | 18.58 | <.0001 |
| **frc=20 synch 75% early** | -595.46 | 6.7086 | 2112 | -88.76 | <.0001 |
| **frc=20 synch 90% early** | -699.85 | 6.3294 | 2112 | -110.57 | <.0001 |
| **frc=20 synch 10% late** | -19.7602 | 7.7200 | 2112 | -2.56 | 0.0105 |
| **frc=20 synch 25% late** | -57.2865 | 6.6999 | 2112 | -8.55 | <.0001 |
| **frc=20 synch 50% late** | -147.99 | 6.5576 | 2112 | -22.57 | <.0001 |
| **frc=20 synch 75% late** | -309.17 | 6.8941 | 2112 | -44.85 | <.0001 |
| **frc=20 synch 90% late** | -395.83 | 6.6600 | 2112 | -59.43 | <.0001 |
| **frc=50 asynch 10% early** | 108.79 | 8.5519 | 2112 | 12.72 | <.0001 |
| **frc=50 asynch 25% early** | 253.72 | 8.3246 | 2112 | 30.48 | <.0001 |
| **frc=50 asynch 50% early** | 427.15 | 8.8846 | 2112 | 48.08 | <.0001 |
| **frc=50 asynch 75% early** | -1709.96 | 8.8104 | 2112 | -194.08 | <.0001 |
| **frc=50 asynch 90% early** | -2041.25 | 8.1583 | 2112 | -250.20 | <.0001 |
| **frc=50 asynch 10% late** | -79.3218 | 8.2410 | 2112 | -9.63 | <.0001 |
| **frc=50 asynch 25% late** | -231.31 | 8.2476 | 2112 | -28.05 | <.0001 |
| **frc=50 asynch 50% late** | -636.00 | 8.0353 | 2112 | -79.15 | <.0001 |
| **frc=50 asynch 75% late** | -1138.68 | 8.2068 | 2112 | -138.75 | <.0001 |
| **frc=50 asynch 90% late** | -1237.17 | 7.9078 | 2112 | -156.45 | <.0001 |
| **frc=50 synch 10% early** | 1.8185 | 7.5023 | 2112 | 0.24 | 0.8085 |
| **frc=50 synch 25% early** | 13.9971 | 7.6366 | 2112 | 1.83 | 0.0670 |
| **frc=50 synch 50% early** | -171.82 | 7.8260 | 2112 | -21.95 | <.0001 |
| **frc=50 synch 75% early** | -1254.44 | 8.0689 | 2112 | -155.47 | <.0001 |
| **frc=50 synch 90% early** | -1558.36 | 7.6568 | 2112 | -203.53 | <.0001 |
| **frc=50 synch 10% late** | -113.01 | 7.3982 | 2112 | -15.28 | <.0001 |
| **frc=50 synch 25% late** | -312.58 | 7.7139 | 2112 | -40.52 | <.0001 |
| **frc=50 synch 50% late** | -728.91 | 7.7067 | 2112 | -94.58 | <.0001 |
| **frc=50 synch 75% late** | -1169.56 | 8.2416 | 2112 | -141.91 | <.0001 |
| **frc=50 synch 90% late** | -1259.78 | 7.4146 | 2112 | -169.91 | <.0001 |
| **frc=100 asynch 10% early** | 198.37 | 7.8707 | 2112 | 25.20 | <.0001 |
| **frc=100 asynch 25% early** | 492.40 | 7.9398 | 2112 | 62.02 | <.0001 |
| **frc=100 asynch 50% early** | 767.83 | 7.8430 | 2112 | 97.90 | <.0001 |
| **frc=100 asynch 75% early** | -3462.46 | 10.5288 | 2112 | -328.86 | <.0001 |
| **frc=100 asynch 90% early** | -4148.18 | 6.9809 | 2112 | -594.22 | <.0001 |
| **frc=100 asynch 10% late** | -171.40 | 7.2966 | 2112 | -23.49 | <.0001 |
| **frc=100 asynch 25% late** | -516.02 | 7.4518 | 2112 | -69.25 | <.0001 |
| **frc=100 asynch 50% late** | -1412.35 | 8.5021 | 2112 | -166.12 | <.0001 |
| **frc=100 asynch 75% late** | -2789.58 | 7.4624 | 2112 | -373.82 | <.0001 |
| **frc=100 asynch 90% late** | -3040.03 | 7.2835 | 2112 | -417.39 | <.0001 |
| **frc=100 synch 10% early** | -2.8544 | 6.8151 | 2112 | -0.42 | 0.6754 |
| **frc=100 synch 25% early** | -29.8496 | 7.1894 | 2112 | -4.15 | <.0001 |
| **frc=100 synch 50% early** | -455.73 | 7.4055 | 2112 | -61.54 | <.0001 |
| **frc=100 synch 75% early** | -2292.82 | 7.4646 | 2112 | -307.16 | <.0001 |
| **frc=100 synch 90% early** | -2802.84 | 6.5183 | 2112 | -430.00 | <.0001 |
| **frc=100 synch 10% late** | -222.81 | 7.0112 | 2112 | -31.78 | <.0001 |
| **frc=100 synch 25% late** | -608.25 | 7.7831 | 2112 | -78.15 | <.0001 |
| **frc=100 synch 50% late** | -1468.37 | 7.7734 | 2112 | -188.90 | <.0001 |
| **frc=100 synch 75% late** | -2407.41 | 6.9306 | 2112 | -347.36 | <.0001 |
| **frc=100 synch 90% late** | -2499.14 | 6.8617 | 2112 | -364.22 | <.0001 |