Public Master File 006555 (submission A-0000)

PMF006555_Drouillard_2025_abscess analysis output

Analysis Output Study 1U01FD006804-01: primary and secondary variables

Center for
Veterinary Medicine

The SAS System

The GLIMMIX Procedure

EP=LA CONDITION EVENT=PRESENT

Model Information	
Data Set	WORK.ANALYSIS_BIN
Response Variable (Events)	Y
Response Variable (Trials)	PEN_SIZE
Response Distribution	Binomial
Link Function	Logit
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Residual PL
Degrees of Freedom Method	None

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	66
Number of Observations Used	66
Number of Events	192
Number of Trials	448

Dimensions	
G-side Cov. Parameters	2
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	66

The SAS System

The GLIMMIX Procedure

EP=LA CONDITION EVENT=PRESENT

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries (User)	2
Lower Boundaries	0
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Subiterations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	**11**	154.06468791	1.99596965	9.839128
1	**0**	**0**	153.92703747	0.00176908	9.98359
2	**0**	**0**	153.9359015	0.00000014	9.97596
3	**0**	**0**	153.93590183	0.00000000	9.975959

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics	
-2 Res Log Pseudo-Likelihood	153.94
Generalized Chi-Square	60.67
Gener. Chi-Square / DF	0.96

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.000100	.
Pen	0.000100	.

The SAS System

The GLIMMIX Procedure

EP=LA CONDITION EVENT=PRESENT

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	Infty	0.06	0.9398

Treatment Least Squares Means							
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Mean**	**Standard Error Mean**
X	-0.2564	0.1652	Infty	-1.55	0.1207	0.4362	0.04063
Y	-0.2719	0.1659	Infty	-1.64	0.1013	0.4324	0.04073
Z	-0.3342	0.1651	Infty	-2.02	0.0429	0.4172	0.04013

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	0.01550	0.2342	Infty	0.07	0.9472
X	Z	0.07777	0.2335	Infty	0.33	0.7391
Y	Z	0.06227	0.2340	Infty	0.27	0.7902

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
X	-0.2564	A
		A
Y	-0.2719	A
		A
Z	-0.3342	A

The SAS System

The GLIMMIX Procedure

EP=LA SEVERITY EVENT=MODERATE OR SEVERE

Model Information	
Data Set	WORK.ANALYSIS_BIN
Response Variable (Events)	Y
Response Variable (Trials)	PEN_SIZE
Response Distribution	Binomial
Link Function	Logit
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Residual PL
Degrees of Freedom Method	None

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	66
Number of Observations Used	66
Number of Events	143
Number of Trials	448

Dimensions	
G-side Cov. Parameters	2
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	66

The SAS System

The GLIMMIX Procedure

EP=LA SEVERITY EVENT=MODERATE OR SEVERE

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries (User)	2
Lower Boundaries	0
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Subiterations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	**6**	148.73716227	1.99588415	30.29662
1	**0**	**0**	150.29822459	0.00406757	29.56723
2	**0**	**0**	150.35052454	0.00000179	29.52433
3	**0**	**0**	150.35053729	0.00000000	29.52431

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics	
-2 Res Log Pseudo-Likelihood	150.35
Generalized Chi-Square	49.32
Gener. Chi-Square / DF	0.78

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.000100	.
Pen	0.000100	.

The SAS System

The GLIMMIX Procedure

EP=LA SEVERITY EVENT=MODERATE OR SEVERE

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	Infty	0.75	0.4735

Treatment Least Squares Means							
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Mean**	**Standard Error Mean**
X	-0.5941	0.1712	Infty	-3.47	0.0005	0.3557	0.03922
Y	-0.7963	0.1776	Infty	-4.48	<.0001	0.3108	0.03805
Z	-0.8886	0.1791	Infty	-4.96	<.0001	0.2914	0.03698

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	0.2023	0.2467	Infty	0.82	0.4122
X	Z	0.2946	0.2477	Infty	1.19	0.2344
Y	Z	0.09231	0.2522	Infty	0.37	0.7144

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
X	-0.5941	A
		A
Y	-0.7963	A
		A
Z	-0.8886	A

The SAS System

The GLIMMIX Procedure

EP=LA SEVERITY EVENT=SEVERE

Model Information	
Data Set	WORK.ANALYSIS_BIN
Response Variable (Events)	Y
Response Variable (Trials)	PEN_SIZE
Response Distribution	Binomial
Link Function	Logit
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Residual PL
Degrees of Freedom Method	None

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	66
Number of Observations Used	66
Number of Events	76
Number of Trials	448

Dimensions	
G-side Cov. Parameters	2
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	66

The SAS System

The GLIMMIX Procedure

EP=LA SEVERITY EVENT=SEVERE

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries (User)	2
Lower Boundaries	0
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Subiterations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	**4**	182.49247061	0.56531018	5.185677
1	**0**	**4**	192.52019617	0.40027861	1.706387
2	**0**	**2**	193.28562126	0.02610802	1.461242
3	**0**	**2**	193.36204826	0.00208900	1.438432
4	**0**	**1**	193.36449286	0.00006921	1.437829
5	**0**	**1**	193.36456653	0.00000211	1.437812
6	**0**	**0**	193.36456873	0.00000000	1.437811

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics	
-2 Res Log Pseudo-Likelihood	193.36
Generalized Chi-Square	57.60
Gener. Chi-Square / DF	0.91

The SAS System

The GLIMMIX Procedure

EP=LA SEVERITY EVENT=SEVERE

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.1111	0.1403
Pen	0.000100	.

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	Infty	2.14	0.1175

Treatment Least Squares Means							
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Mean**	**Standard Error Mean**
X	-1.2621	0.2102	Infty	-6.00	<.0001	0.2206	0.03615
Y	-1.7535	0.2423	Infty	-7.24	<.0001	0.1476	0.03048
Z	-1.8316	0.2462	Infty	-7.44	<.0001	0.1380	0.02929

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	0.4914	0.3045	Infty	1.61	0.1066
X	Z	0.5695	0.3076	Infty	1.85	0.0641
Y	Z	0.07815	0.3303	Infty	0.24	0.8130

The SAS System

The GLIMMIX Procedure

EP=LA SEVERITY EVENT=SEVERE

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
X	-1.2621	A
		A
Y	-1.7535	A
		A
Z	-1.8316	A

The SAS System

The GLIMMIX Procedure

EP=FINAL ULTRASOUND EVENT=PRESENT

Model Information	
Data Set	WORK.ANALYSIS_BIN
Response Variable (Events)	Y
Response Variable (Trials)	PEN_SIZE
Response Distribution	Binomial
Link Function	Logit
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Residual PL
Degrees of Freedom Method	None

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	66
Number of Observations Used	66
Number of Events	16
Number of Trials	448

Dimensions	
G-side Cov. Parameters	2
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	66

The SAS System

The GLIMMIX Procedure

EP=FINAL ULTRASOUND EVENT=PRESENT

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries (User)	2
Lower Boundaries	0
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Subiterations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	**13**	230.66831222	1.99847118	7.381742
1	**0**	**0**	268.03027733	0.23097546	3.05854
2	**0**	**0**	279.4703366	0.03164174	1.877563
3	**0**	**0**	280.29824686	0.00032543	1.809735
4	**0**	**0**	280.30312738	0.00000002	1.809371
5	**0**	**0**	280.3031276	0.00000000	1.80937

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics	
-2 Res Log Pseudo-Likelihood	280.30
Generalized Chi-Square	56.35
Gener. Chi-Square / DF	0.89

The SAS System

The GLIMMIX Procedure

EP=FINAL ULTRASOUND EVENT=PRESENT

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.000100	.
Pen	0.000100	.

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	Infty	1.87	0.1543

Treatment Least Squares Means							
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Mean**	**Standard Error Mean**
X	-2.7444	0.3439	Infty	-7.98	<.0001	0.06040	0.01952
Y	-3.8781	0.5833	Infty	-6.65	<.0001	0.02027	0.01158
Z	-3.6041	0.5068	Infty	-7.11	<.0001	0.02649	0.01307

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	1.1337	0.6771	Infty	1.67	0.0941
X	Z	0.8597	0.6124	Infty	1.40	0.1604
Y	Z	-0.2740	0.7727	Infty	-0.35	0.7229

The SAS System

The GLIMMIX Procedure

EP=FINAL ULTRASOUND EVENT=PRESENT

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
X	-2.7444	A
		A
Z	-3.6041	A
		A
Y	-3.8781	A

The SAS System

The GLIMMIX Procedure

EP=FINAL YIELD GRADE

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Multinomial (ordered)
Link Function	Cumulative Logit
Variance Function	Default
Estimation Technique	Residual PL
Degrees of Freedom Method	None

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	446

Response Profile		
Ordered Value	**RESP**	**Total Frequency**
1	1	12
2	2	154
3	3	228
4	4	52

The GLIMMIX procedure is modeling the probabilities of levels of RESP having lower Ordered Values in the Response Profile table.

The SAS System

The GLIMMIX Procedure

EP=FINAL YIELD GRADE

Dimensions	
G-side Cov. Parameters	2
Columns in X	6
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	446

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries (User)	2
Lower Boundaries	0
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Subiterations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	**4**	5309.0471054	0.17344513	0.000469
1	**0**	**4**	5374.4659838	0.11435353	0.000039
2	**0**	**3**	5377.4207878	0.01121086	0.00001
3	**0**	**3**	5379.7564367	0.00417743	4.088E-8
4	**0**	**2**	5379.9225805	0.00049788	1.172E-6
5	**0**	**3**	5380.0048301	0.00015477	1.098E-9
6	**0**	**1**	5380.0127595	0.00001246	0.000087
7	**0**	**1**	5380.015912	0.00001596	0.000053
8	**0**	**1**	5380.0159734	0.00000498	0.000061
9	**0**	**1**	5380.0162214	0.00000867	0.000126
10	**0**	**1**	5380.0161565	0.00000582	4.107E-6

The SAS System

The GLIMMIX Procedure

EP=FINAL YIELD GRADE

Iteration History					
Iteration	**Restarts**	**Subiterations**	**Objective Function**	**Change**	**Max Gradient**
11	**0**	**0**	5380.0163046	0.00000020	1.794E-6
12	**0**	**0**	5380.0162097	0.00000001	1.044E-6

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics	
-2 Res Log Pseudo-Likelihood	5380.02

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.07255	0.09913
Pen	0.09876	0.1411

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	Infty	1.15	0.3182

Estimates							
Label	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Mean**	**Standard Error Mean**
X VS. Y	0.2472	0.2429	Infty	1.02	0.3087	0.5615	0.05980
X VS. Z	-0.1122	0.2409	Infty	-0.47	0.6413	0.4720	0.06004
Y VS. Z	-0.3595	0.2427	Infty	-1.48	0.1385	0.4111	0.05875

The SAS System

The GLIMMIX Procedure

EP=USDA QUALITY GRADE

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Multinomial (ordered)
Link Function	Cumulative Logit
Variance Function	Default
Estimation Technique	Residual PL
Degrees of Freedom Method	None

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	446

Response Profile		
Ordered Value	**RESP**	**Total Frequency**
1	0	4
2	1	29
3	2	373
4	3	40

The GLIMMIX procedure is modeling the probabilities of levels of RESP having lower Ordered Values in the Response Profile table.

The SAS System

The GLIMMIX Procedure

EP=USDA QUALITY GRADE

Dimensions	
G-side Cov. Parameters	2
Columns in X	6
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	446

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries (User)	2
Lower Boundaries	0
Upper Boundaries	0
Fixed Effects	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Subiterations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	**6**	6420.0555157	1.99740599	12.75139
1	**0**	**0**	6557.7332458	0.00610748	12.81997
2	**0**	**0**	6551.0234215	0.00038588	12.87276
3	**0**	**0**	6551.054274	0.00000949	12.87294
4	**0**	**0**	6551.0546287	0.00000028	12.87294
5	**0**	**0**	6551.05464	0.00000001	12.87294

Convergence criterion (PCONV=1.11022E-8) satisfied.

Fit Statistics	
-2 Res Log Pseudo-Likelihood	6551.05

The SAS System

The GLIMMIX Procedure

EP=USDA QUALITY GRADE

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.000100	.
Pen	0.000100	.

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	Infty	0.70	0.4990

Estimates							
Label	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**	**Mean**	**Standard Error Mean**
X VS. Y	-0.3681	0.3150	Infty	-1.17	0.2427	0.4090	0.07615
X VS. Z	-0.1373	0.3111	Infty	-0.44	0.6590	0.4657	0.07740
Y VS. Z	0.2308	0.3144	Infty	0.73	0.4628	0.5574	0.07756

The SAS System

The GENMOD Procedure

EP=FINAL YIELD GRADE

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Deviance	4	3.8031	0.9508
Scaled Deviance	4	3.8031	0.9508
Pearson Chi-Square	4	3.8147	0.9537
Scaled Pearson X2	4	3.8147	0.9537
Log Likelihood		-470.6870	
Full Log Likelihood		-21.3415	
AIC (smaller is better)		52.6831	
AICC (smaller is better)		52.8195	
BIC (smaller is better)		73.1847	

The SAS System

The GENMOD Procedure

EP=USDA QUALITY GRADE

Criteria For Assessing Goodness Of Fit			
Criterion	**DF**	**Value**	**Value/DF**
Deviance	4	7.6042	1.9010
Scaled Deviance	4	7.6042	1.9010
Pearson Chi-Square	4	6.4055	1.6014
Scaled Pearson X2	4	6.4055	1.6014
Log Likelihood		-260.5420	
Full Log Likelihood		-18.8922	
AIC (smaller is better)		47.7845	
AICC (smaller is better)		47.9209	
BIC (smaller is better)		68.2861	

The SAS System

The GLIMMIX Procedure

EP=HCW (LB)

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	446

Dimensions	
G-side Cov. Parameters	2
R-side Cov. Parameters	1
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	446

The SAS System

The GLIMMIX Procedure

EP=HCW (LB)

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries	2
Upper Boundaries	0
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Evaluations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	4	5006.7247076	.	4.773898
1	**0**	4	5006.7168297	0.00787785	1.544349
2	**0**	4	5006.7163212	0.00050850	1.511559
3	**0**	2	5006.715478	0.00084319	0.490816
4	**0**	2	5006.7153799	0.00009814	0.006139
5	**0**	2	5006.7153799	0.00000002	0.000025

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

Fit Statistics	
-2 Res Log Likelihood	5006.72
AIC (smaller is better)	5012.72
AICC (smaller is better)	5012.77
BIC (smaller is better)	5015.99
CAIC (smaller is better)	5018.99
HQIC (smaller is better)	5013.49
Generalized Chi-Square	1901171
Gener. Chi-Square / DF	4291.58

The SAS System

The GLIMMIX Procedure

EP=HCW (LB)

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	299.43	180.34
Pen	146.13	174.70
Residual	4291.58	311.38

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	42.82	0.92	0.4070

Treatment Least Squares Means					
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	903.43	7.0073	53.86	128.93	<.0001
Y	913.62	7.0380	54.68	129.81	<.0001
Z	912.99	6.9949	53.41	130.52	<.0001

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	-10.1984	8.4499	43.1	-1.21	0.2340
X	Z	-9.5626	8.4154	42.48	-1.14	0.2622
Y	Z	0.6358	8.4407	42.9	0.08	0.9403

The SAS System

The GLIMMIX Procedure

EP=HCW (LB)

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
Y	913.62	A
		A
Z	912.99	A
		A
X	903.43	A

The SAS System

The GLIMMIX Procedure

EP=CALCULATED YIELD GRADE

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	445

Dimensions	
G-side Cov. Parameters	2
R-side Cov. Parameters	1
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	445

The SAS System

The GLIMMIX Procedure

EP=CALCULATED YIELD GRADE

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries	2
Upper Boundaries	0
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Evaluations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	4	843.02476536	.	3.663875
1	**0**	4	843.0211058	0.00365956	1.322686
2	**0**	5	843.02057328	0.00053252	0.089264
3	**0**	2	843.02057162	0.00000166	0.002128

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

Fit Statistics	
-2 Res Log Likelihood	843.02
AIC (smaller is better)	849.02
AICC (smaller is better)	849.08
BIC (smaller is better)	852.29
CAIC (smaller is better)	855.29
HQIC (smaller is better)	849.79
Generalized Chi-Square	162.68
Gener. Chi-Square / DF	0.37

The SAS System

The GLIMMIX Procedure

EP=CALCULATED YIELD GRADE

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.01420	0.01108
Pen	0.003511	0.01348
Residual	0.3681	0.02678

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	40.74	1.20	0.3119

Treatment Least Squares Means					
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	3.1580	0.05741	57.96	55.01	<.0001
Y	3.2500	0.05757	58.43	56.45	<.0001
Z	3.1475	0.05712	56.75	55.10	<.0001

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	-0.09202	0.07292	41.15	-1.26	0.2141
X	Z	0.01053	0.07257	40.42	0.15	0.8853
Y	Z	0.1026	0.07270	40.67	1.41	0.1660

The SAS System

The GLIMMIX Procedure

EP=CALCULATED YIELD GRADE

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
Y	3.2500	A
		A
X	3.1580	A
		A
Z	3.1475	A

The SAS System

The GLIMMIX Procedure

EP=RIB EYE AREA (IN^2)

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	445

Dimensions	
G-side Cov. Parameters	2
R-side Cov. Parameters	1
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	445

The SAS System

The GLIMMIX Procedure

EP=RIB EYE AREA (IN^2)

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries	2
Upper Boundaries	0
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Evaluations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	4	1478.6055297	.	2.205939
1	**0**	4	1478.6016568	0.00387290	0.460525
2	**0**	4	1478.6015523	0.00010452	0.01368
3	**0**	2	1478.6015522	0.00000013	0.000156

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

Fit Statistics	
-2 Res Log Likelihood	1478.60
AIC (smaller is better)	1484.60
AICC (smaller is better)	1484.66
BIC (smaller is better)	1487.87
CAIC (smaller is better)	1490.87
HQIC (smaller is better)	1485.37
Generalized Chi-Square	667.13
Gener. Chi-Square / DF	1.51

The SAS System

The GLIMMIX Procedure

EP=RIB EYE AREA (IN^2)

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.1445	0.07181
Pen	0.02236	0.05586
Residual	1.5093	0.1096

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	42.22	1.24	0.3008

Treatment Least Squares Means					
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	14.0181	0.1334	49.74	105.07	<.0001
Y	14.1692	0.1337	50.09	105.97	<.0001
Z	14.2496	0.1329	48.96	107.21	<.0001

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	-0.1511	0.1501	42.63	-1.01	0.3198
X	Z	-0.2315	0.1494	41.88	-1.55	0.1288
Y	Z	-0.08040	0.1497	42.15	-0.54	0.5940

The SAS System

The GLIMMIX Procedure

EP=RIB EYE AREA (IN^2)

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
Z	14.2496	A
		A
Y	14.1692	A
		A
X	14.0181	A

The SAS System

The GLIMMIX Procedure

EP=MARBLING SCORE

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	445

Dimensions	
G-side Cov. Parameters	2
R-side Cov. Parameters	1
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	445

The SAS System

The GLIMMIX Procedure

EP=MARBLING SCORE

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries	2
Upper Boundaries	0
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Evaluations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	4	5378.734088	.	0

Convergence criterion (ABSGCONV=0.00001) satisfied.

Estimated G matrix is not positive definite.

Fit Statistics	
-2 Res Log Likelihood	5378.73
AIC (smaller is better)	5380.73
AICC (smaller is better)	5380.74
BIC (smaller is better)	5381.83
CAIC (smaller is better)	5382.83
HQIC (smaller is better)	5380.99
Generalized Chi-Square	4821433
Gener. Chi-Square / DF	10908.22

The SAS System

The GLIMMIX Procedure

EP=MARBLING SCORE

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0	.
Pen	0	.
Residual	10908	733.77

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	442	0.00	0.9971

Treatment Least Squares Means					
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	531.73	8.5851	442	61.94	<.0001
Y	530.81	8.6143	442	61.62	<.0001
Z	531.20	8.5277	442	62.29	<.0001

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	0.9168	12.1618	442	0.08	0.9399
X	Z	0.5297	12.1006	442	0.04	0.9651
Y	Z	-0.3871	12.1213	442	-0.03	0.9745

The SAS System

The GLIMMIX Procedure

EP=MARBLING SCORE

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
X	531.73	A
		A
Z	531.20	A
		A
Y	530.81	A

The SAS System

The GLIMMIX Procedure

EP=12TH RIB BODY FAT THICKNESS (IN)

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	445

Dimensions	
G-side Cov. Parameters	2
R-side Cov. Parameters	1
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	445

The SAS System

The GLIMMIX Procedure

EP=12TH RIB BODY FAT THICKNESS (IN)

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries	2
Upper Boundaries	0
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Evaluations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	4	-464.7460785	.	1.255325
1	**0**	3	-464.7471912	0.00111270	0.643497
2	**0**	5	-464.747223	0.00003188	0.244378
3	**0**	2	-464.7472474	0.00002436	0.001558
4	**0**	2	-464.7472474	0.00000000	0.000021

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

Fit Statistics	
-2 Res Log Likelihood	-464.75
AIC (smaller is better)	-458.75
AICC (smaller is better)	-458.69
BIC (smaller is better)	-455.47
CAIC (smaller is better)	-452.47
HQIC (smaller is better)	-457.98
Generalized Chi-Square	8.33
Gener. Chi-Square / DF	0.02

The SAS System

The GLIMMIX Procedure

EP=12TH RIB BODY FAT THICKNESS (IN)

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.000141	0.000510
Pen	0.000981	0.000856
Residual	0.01885	0.001370

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	41.29	2.29	0.1137

Treatment Least Squares Means					
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	0.5357	0.01336	62.22	40.08	<.0001
Y	0.5723	0.01340	62.71	42.70	<.0001
Z	0.5404	0.01330	60.99	40.62	<.0001

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	-0.03660	0.01858	41.63	-1.97	0.0556
X	Z	-0.00476	0.01851	41.03	-0.26	0.7984
Y	Z	0.03184	0.01854	41.24	1.72	0.0935

The SAS System

The GLIMMIX Procedure

EP=12TH RIB BODY FAT THICKNESS (IN)

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
Y	0.5723	A
		A
Z	0.5404	A
		A
X	0.5357	A

The SAS System

The GLIMMIX Procedure

EP=KPH

Model Information	
Data Set	DAT.CARCASS_LONG
Response Variable	RESP
Response Distribution	Gaussian
Link Function	Identity
Variance Function	Default
Variance Matrix	Not blocked
Estimation Technique	Restricted Maximum Likelihood
Degrees of Freedom Method	Kenward-Roger
Fixed Effects SE Adjustment	Kenward-Roger

Class Level Information		
Class	**Levels**	**Values**
Treatment	3	X Y Z
Pen	66	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 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
Block	22	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Number of Observations Read	448
Number of Observations Used	445

Dimensions	
G-side Cov. Parameters	2
R-side Cov. Parameters	1
Columns in X	4
Columns in Z	88
Subjects (Blocks in V)	1
Max Obs per Subject	445

The SAS System

The GLIMMIX Procedure

EP=KPH

Optimization Information	
Optimization Technique	Dual Quasi-Newton
Parameters in Optimization	2
Lower Boundaries	2
Upper Boundaries	0
Fixed Effects	Profiled
Residual Variance	Profiled
Starting From	Data

Iteration History					
Iteration	**Restarts**	**Evaluations**	**Objective Function**	**Change**	**Max Gradient**
0	**0**	4	-338.3888821	.	2.886101
1	**0**	5	-338.3919141	0.00303204	0.998782
2	**0**	4	-338.3923561	0.00044195	0.03582
3	**0**	2	-338.3923566	0.00000052	0.000561

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

Fit Statistics	
-2 Res Log Likelihood	-338.39
AIC (smaller is better)	-332.39
AICC (smaller is better)	-332.34
BIC (smaller is better)	-329.12
CAIC (smaller is better)	-326.12
HQIC (smaller is better)	-331.62
Generalized Chi-Square	10.95
Gener. Chi-Square / DF	0.02

The SAS System

The GLIMMIX Procedure

EP=KPH

Covariance Parameter Estimates		
Cov Parm	**Estimate**	**Standard Error**
Block	0.001140	0.000899
Pen	0.001004	0.001063
Residual	0.02478	0.001802

Type III Tests of Fixed Effects				
Effect	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Treatment	2	41.36	0.09	0.9146

Treatment Least Squares Means					
Treatment	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	1.8268	0.01628	57.71	112.19	<.0001
Y	1.8355	0.01632	58.14	112.44	<.0001
Z	1.8304	0.01622	56.71	112.87	<.0001

Differences of Treatment Least Squares Means						
Treatment	**Treatment**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
X	Y	-0.00871	0.02069	41.72	-0.42	0.6759
X	Z	-0.00361	0.02060	41.08	-0.18	0.8617
Y	Z	0.005097	0.02064	41.31	0.25	0.8061

The SAS System

The GLIMMIX Procedure

EP=KPH

T Grouping for Treatment Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
Treatment	**Estimate**	
Y	1.8355	A
		A
Z	1.8304	A
		A
X	1.8268	A

The SAS System

The FREQ Procedure

Table of LA_score by USFINAL			
LA_score(LA_score)	**USFINAL(USFINAL)**		
Frequency **Percent** **Row Pct**	**ABSCENT**	**PRESENT**	**Total**
ABSCENT	253 56.47 98.83	3 0.67 1.17	256 57.14
PRESENT	179 39.96 93.23	13 2.90 6.77	192 42.86
Total	432 96.43	16 3.57	448 100.00

Statistics for Table of LA_score by USFINAL

Statistic	DF	Value	Prob
Chi-Square	1	9.9869	0.0016
Likelihood Ratio Chi-Square	1	10.3027	0.0013
Continuity Adj. Chi-Square	1	8.4273	0.0037
Mantel-Haenszel Chi-Square	1	9.9646	0.0016
Phi Coefficient		0.1493	
Contingency Coefficient		0.1477	
Cramer's V		0.1493	

Fisher's Exact Test	
Cell (1,1) Frequency (F)	253
Left-sided Pr <= F	0.9998
Right-sided Pr >= F	0.0017
Table Probability (P)	0.0015
Two-sided Pr <= P	0.0032

The SAS System

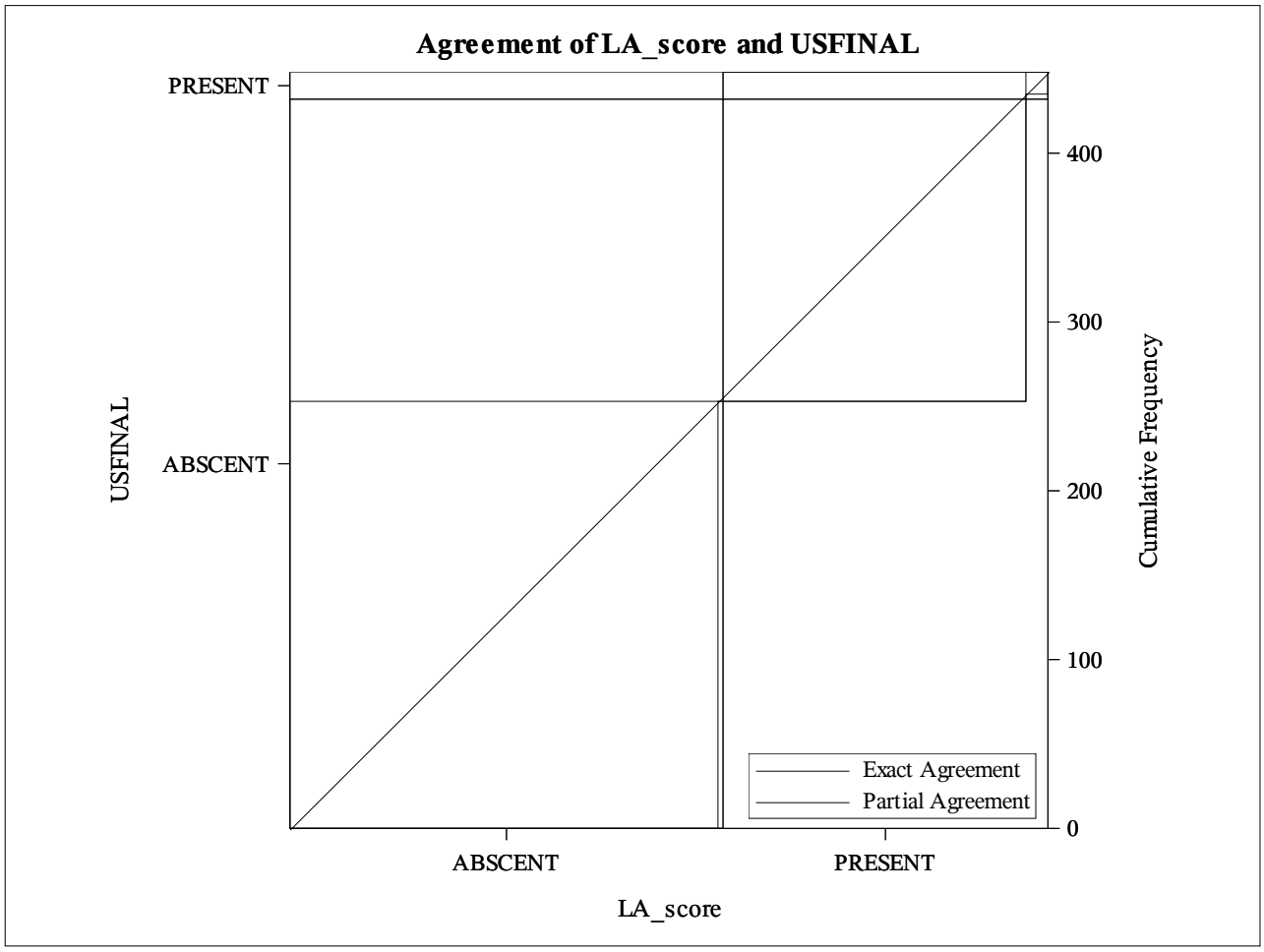
The FREQ Procedure

Statistics for Table of LA_score by USFINAL

McNemar's Test		
Chi-Square	DF	Pr > ChiSq
170.1978	1	<.0001

Simple Kappa Coefficient			
Estimate	Standard Error	95% Confidence Limits	
0.0632	0.0218	0.0204	0.1060

Sample Size = 448



The SAS System

The FREQ Procedure

LA_score=PRESENT

USFINAL				
USFINAL	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
ABSCENT	179	93.23	179	93.23
PRESENT	13	6.77	192	100.00

Binomial Proportion	
USFINAL = PRESENT	
Proportion	0.0677
ASE	0.0181

Confidence Limits for the Binomial Proportion		
Proportion = 0.0677		
Type	**95% Confidence Limits**	
Likelihood Ratio	0.0378	0.1090

Test of H0: Proportion = 0.5	
ASE under H0	0.0361
Z	-11.9800
One-sided Pr < Z	<.0001
Two-sided Pr > |Z|	<.0001

Sample Size = 192

The SAS System

The FREQ Procedure

LA_score=ABSCENT

USFINAL				
USFINAL	**Frequency**	**Percent**	**Cumulative Frequency**	**Cumulative Percent**
ABSCENT	253	98.83	253	98.83
PRESENT	3	1.17	256	100.00

Binomial Proportion	
USFINAL = ABSCENT	
Proportion	0.9883
ASE	0.0067

Confidence Limits for the Binomial Proportion		
Proportion = 0.9883		
Type	**95% Confidence Limits**	
Likelihood Ratio	0.9699	0.9971

Test of H0: Proportion = 0.5	
ASE under H0	0.0313
Z	15.6250
One-sided Pr > Z	<.0001
Two-sided Pr > |Z|	<.0001

Sample Size = 256