

Problem 14.23 edited

Obs	flour	protein	Temp	Day
1	A	5.8	1	1
2	A	4.6	2	1
3	A	4.6	3	1
4	A	11.4	1	2
5	A	5.2	2	2
6	A	5.2	3	2
7	A	10.5	1	3
8	A	9.7	2	3
9	A	4.7	3	3
10	B	8.4	1	1
11	B	5.4	2	1
12	B	4.7	3	1
13	B	7.5	1	2
14	B	7.9	2	2
15	B	7.2	3	2
16	B	14.6	1	3
17	B	7.9	2	3
18	B	6.9	3	3
19	C	16.0	1	1
20	C	5.2	2	1
21	C	4.2	3	1
22	C	17.8	1	2
23	C	7.0	2	2
24	C	6.3	3	2
25	C	16.9	1	3
26	C	11.5	2	3
27	C	7.2	3	3

The GLM Procedure

Class Level Information		
Class	Levels	Values
flour	3	A B C
Temp	3	1 2 3
Day	3	1 2 3

Number of Observations Read	27
Number of Observations Used	27

The GLM Procedure

Dependent Variable: protein

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	10	368.9237037	36.8923704	12.96	<.0001
Error	16	45.5548148	2.8471759		
Corrected Total	26	414.4785185			

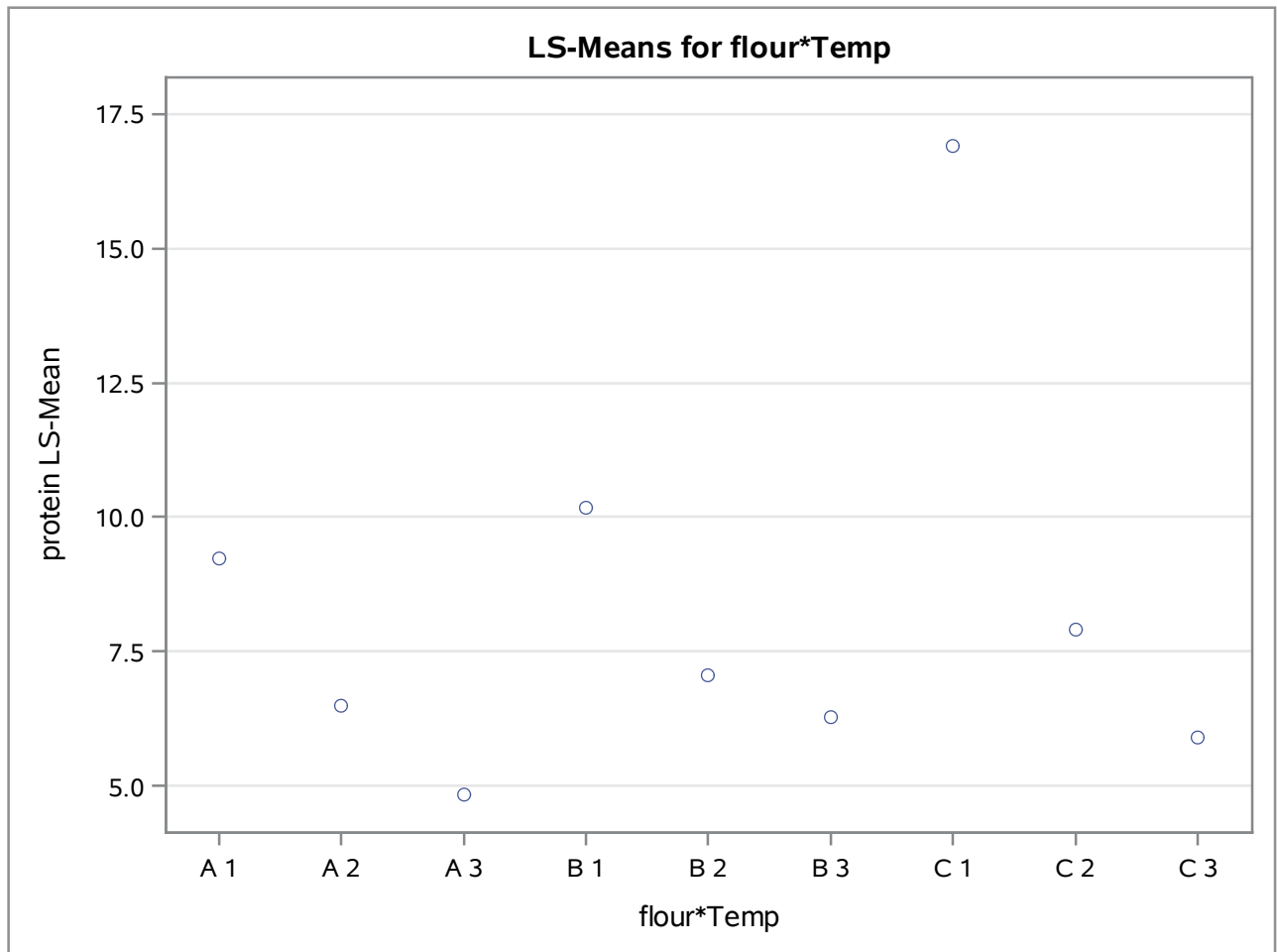
R-Square	Coeff Var	Root MSE	protein Mean
0.890091	20.31148	1.687358	8.307407

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Day	2	53.4785185	26.7392593	9.39	0.0020
flour	2	54.3762963	27.1881481	9.55	0.0019
Temp	2	204.1562963	102.0781481	35.85	<.0001
flour*Temp	4	56.9125926	14.2281481	5.00	0.0083

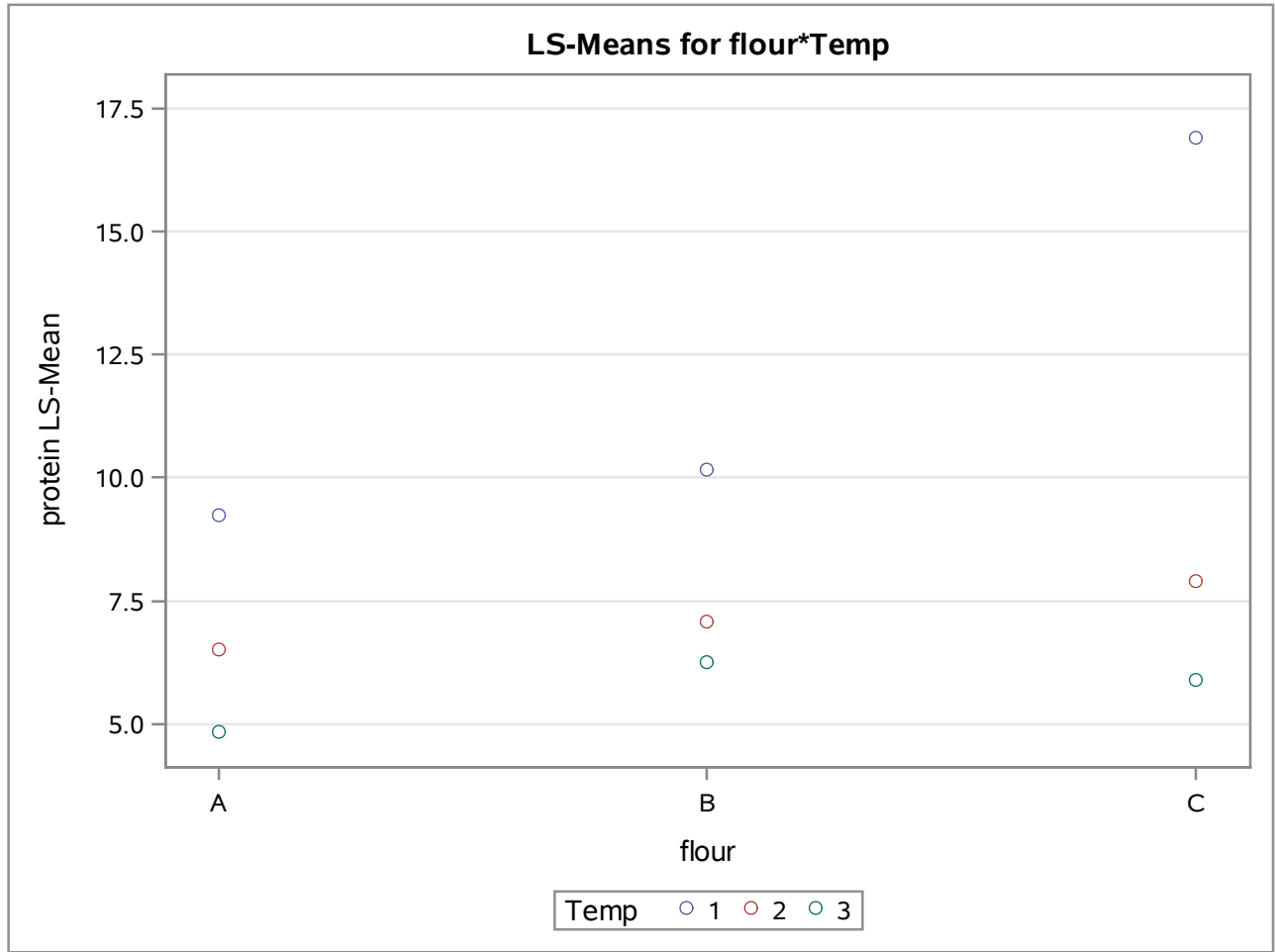
Source	DF	Type III SS	Mean Square	F Value	Pr > F
Day	2	53.4785185	26.7392593	9.39	0.0020
flour	2	54.3762963	27.1881481	9.55	0.0019
Temp	2	204.1562963	102.0781481	35.85	<.0001
flour*Temp	4	56.9125926	14.2281481	5.00	0.0083

The GLM Procedure
Least Squares Means

flour	Temp	protein LSMEAN
A	1	9.2333333
A	2	6.5000000
A	3	4.8333333
B	1	10.1666667
B	2	7.0666667
B	3	6.2666667
C	1	16.9000000
C	2	7.9000000
C	3	5.9000000



The GLM Procedure
Least Squares Means



The GLM Procedure
Least Squares Means

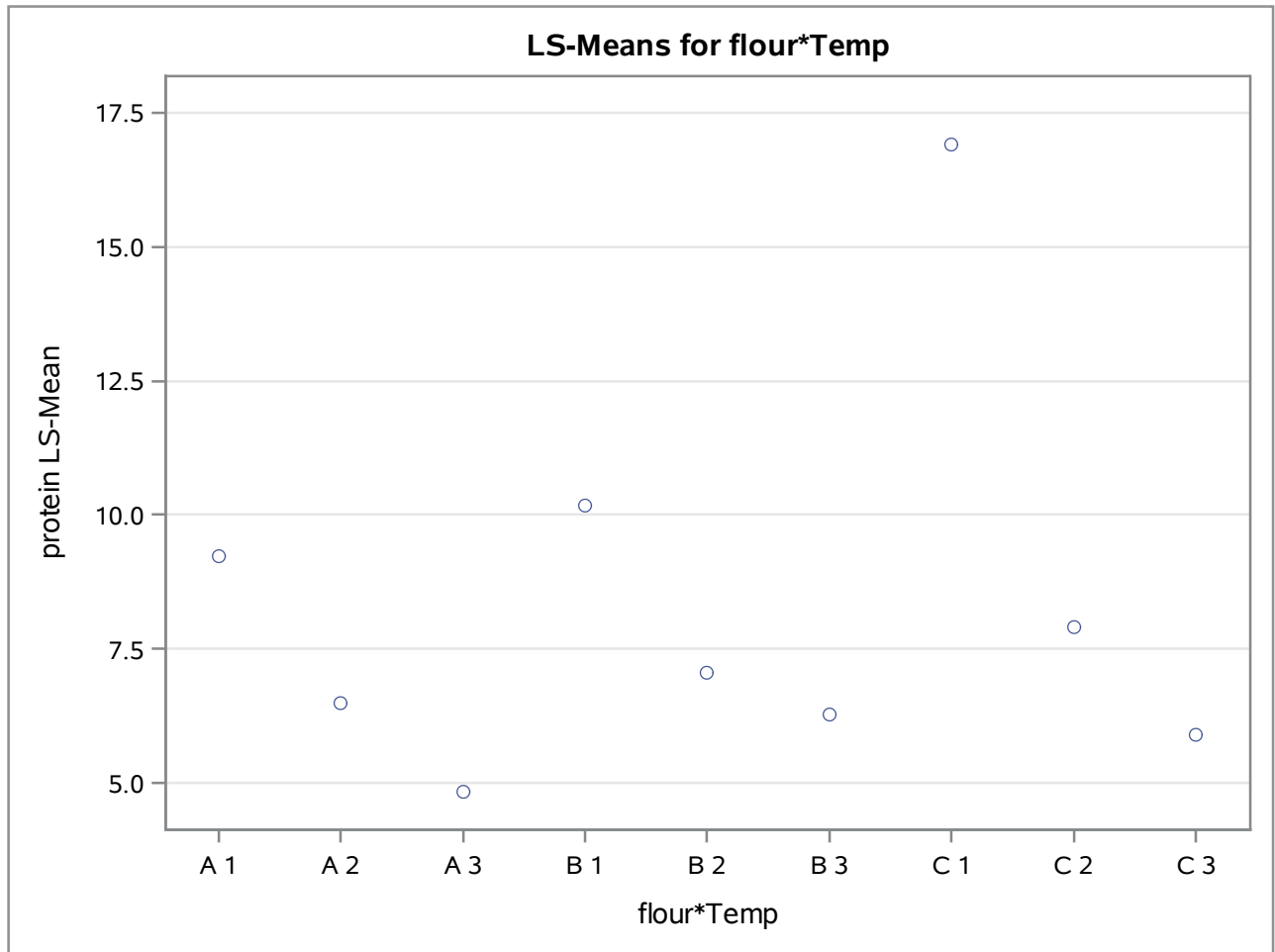
flour*Temp Effect Sliced by Temp for protein					
Temp	DF	Sum of Squares	Mean Square	F Value	Pr > F
1	2	104.986667	52.493333	18.44	<.0001
2	2	2.975556	1.487778	0.52	0.6028
3	2	3.326667	1.663333	0.58	0.5690

The GLM Procedure
 Least Squares Means
 Adjustment for Multiple Comparisons: Tukey

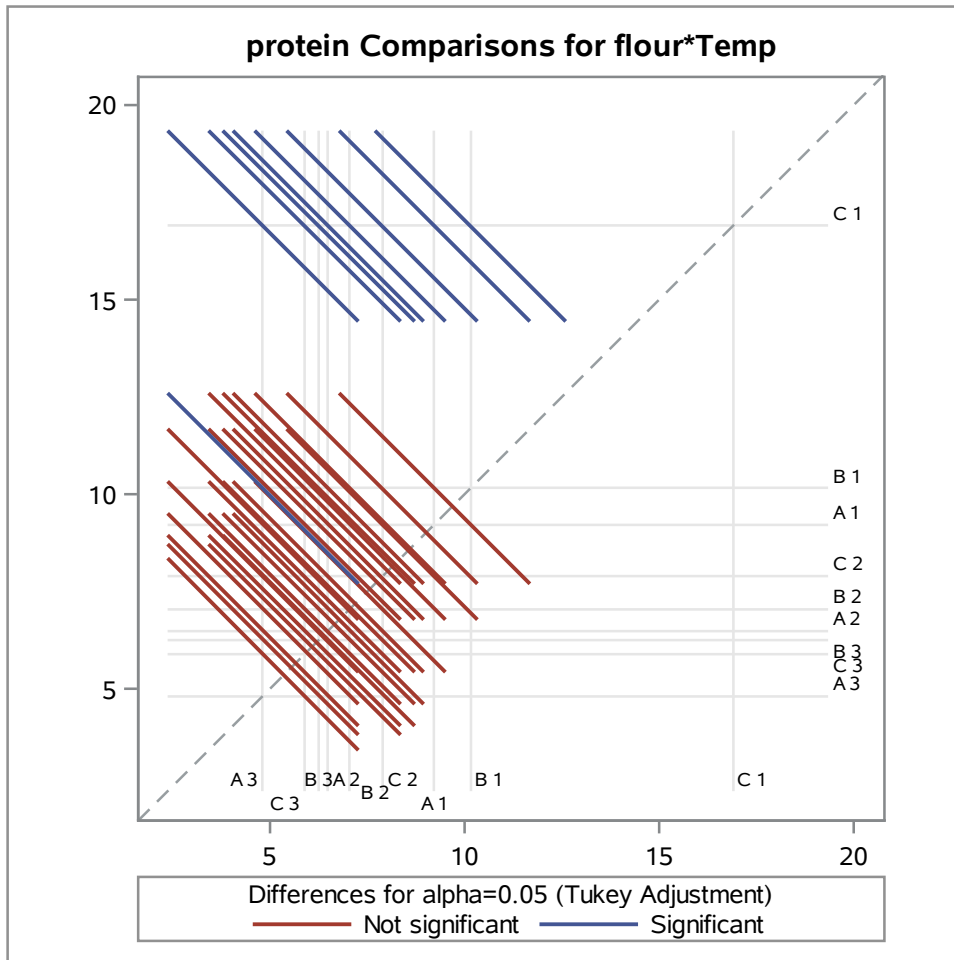
flour	Temp	protein LSMEAN	LSMEAN Number
A	1	9.2333333	1
A	2	6.5000000	2
A	3	4.8333333	3
B	1	10.1666667	4
B	2	7.0666667	5
B	3	6.2666667	6
C	1	16.9000000	7
C	2	7.9000000	8
C	3	5.9000000	9

Least Squares Means for effect flour*Temp Pr > t for H0: LSMean(i)=LSMean(j)									
Dependent Variable: protein									
ij	1	2	3	4	5	6	7	8	9
1		0.5732	0.0970	0.9985	0.8058	0.4749	0.0011	0.9839	0.3366
2	0.5732		0.9427	0.2358	1.0000	1.0000	<.0001	0.9784	0.9999
3	0.0970	0.9427		0.0277	0.7812	0.9752	<.0001	0.4347	0.9961
4	0.9985	0.2358	0.0277		0.4217	0.1801	0.0039	0.7685	0.1149
5	0.8058	1.0000	0.7812	0.4217		0.9995	<.0001	0.9993	0.9930
6	0.4749	1.0000	0.9752	0.1801	0.9995		<.0001	0.9486	1.0000
7	0.0011	<.0001	<.0001	0.0039	<.0001	<.0001		0.0002	<.0001
8	0.9839	0.9784	0.4347	0.7685	0.9993	0.9486	0.0002		0.8614
9	0.3366	0.9999	0.9961	0.1149	0.9930	1.0000	<.0001	0.8614	

The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey

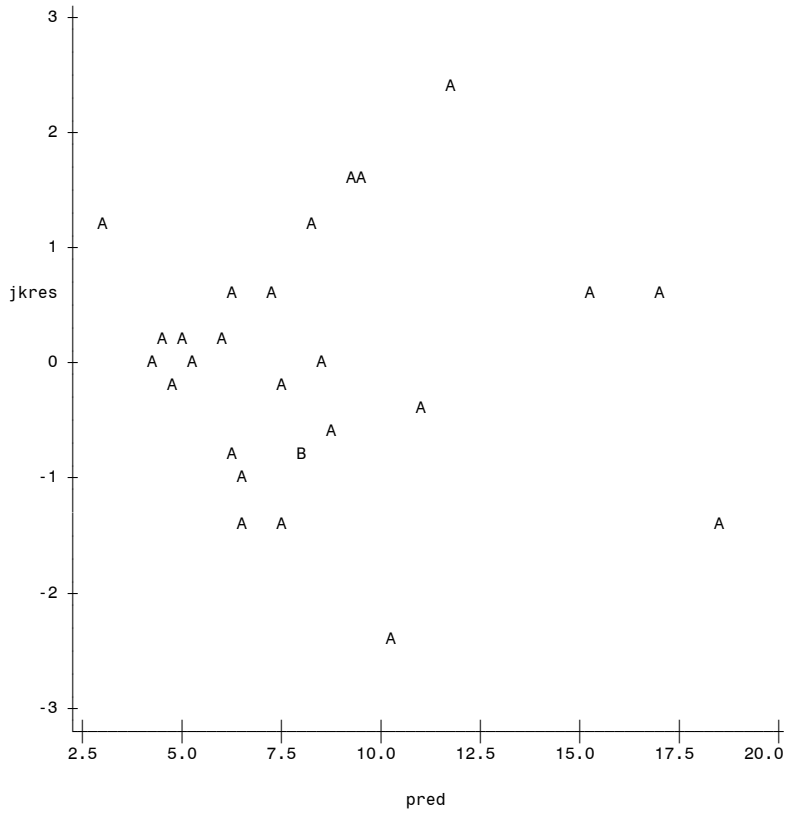


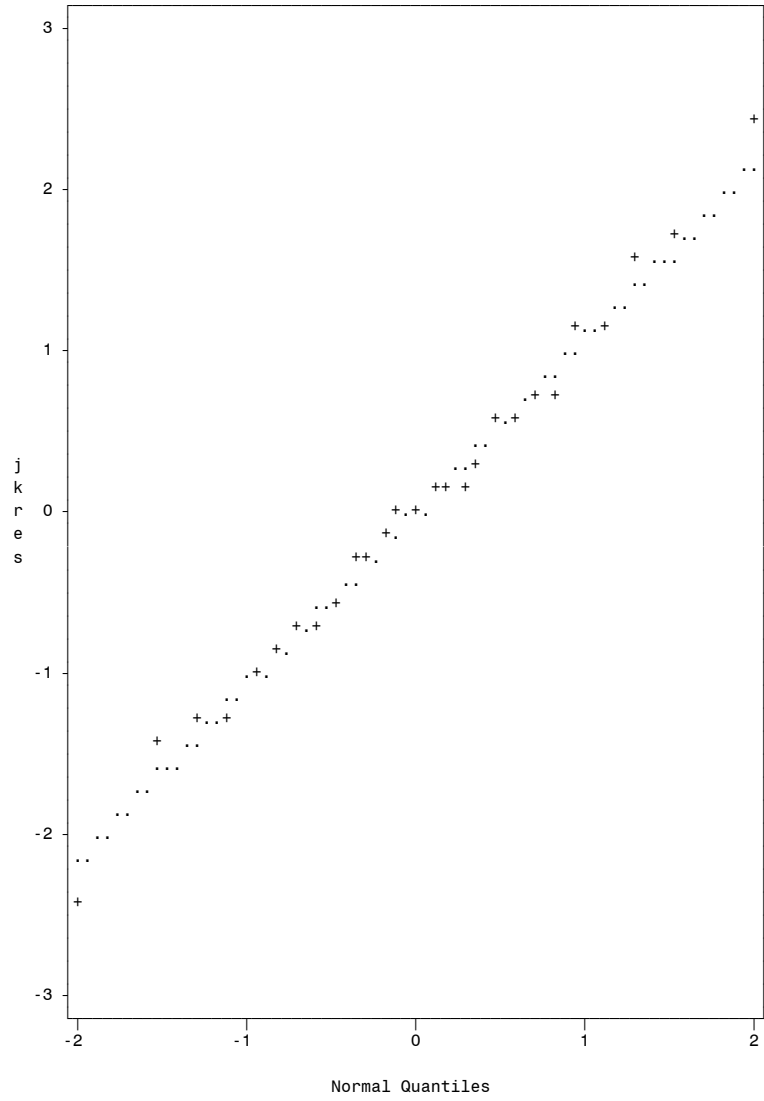
The GLM Procedure
Least Squares Means
Adjustment for Multiple Comparisons: Tukey



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Plot of jkres*pred. Legend: A = 1 obs, B = 2 obs, etc.



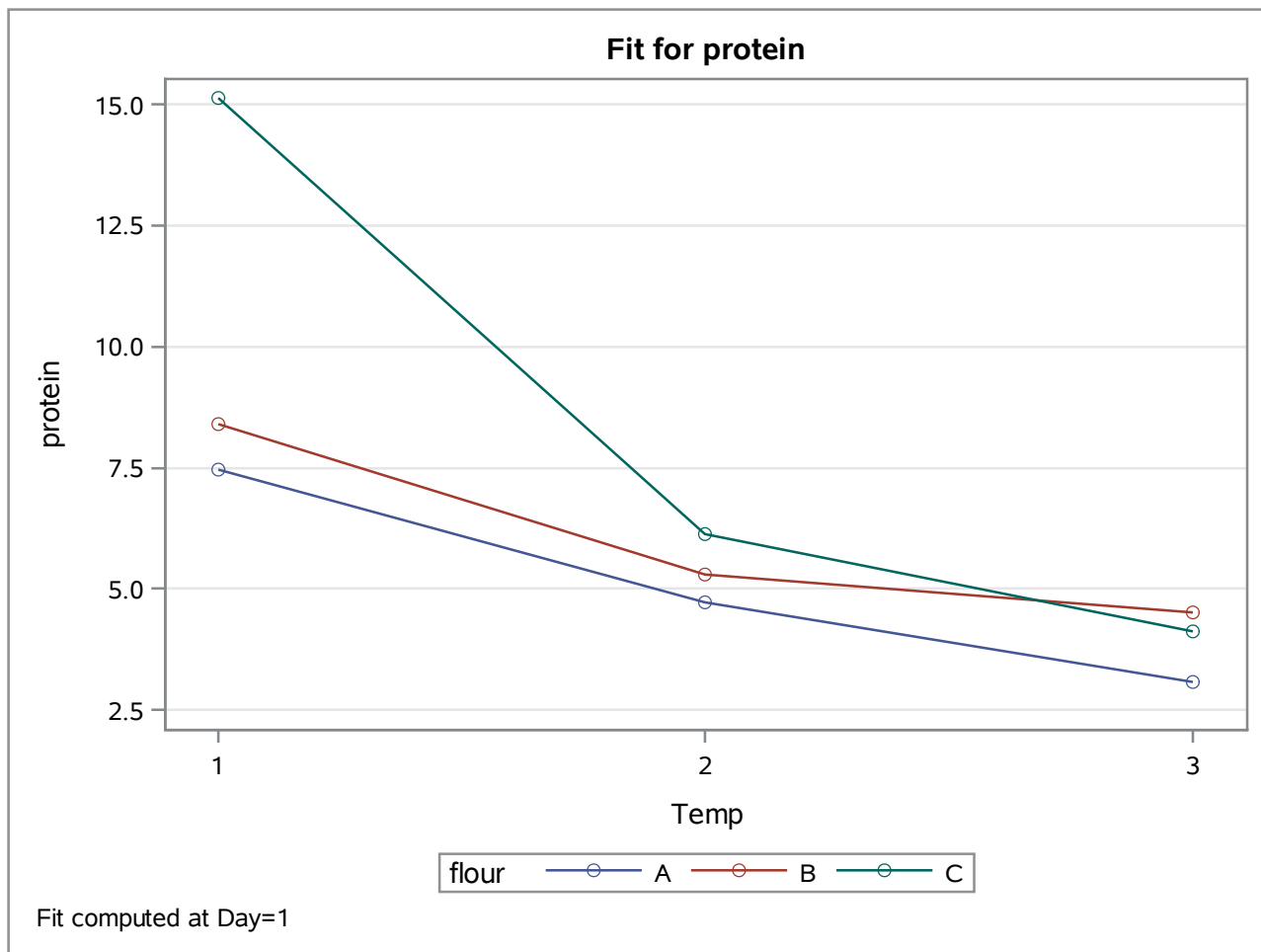


Normal Line: ... Mu=0.0025, Sigma=1.0817

The PLM Procedure

Store Information	
Item Store	WORK.EX15_9OUT
Data Set Created From	WORK.EX15_9
Created By	PROC GLM
Date Created	13JUN18:10:22:44
Response Variable	protein
Class Variables	flour Temp Day
Model Effects	Intercept Day flour Temp flour*Temp

Class Level Information		
Class	Levels	Values
flour	3	A B C
Temp	3	1 2 3
Day	3	1 2 3



The PLM Procedure

