Crude Protein Variation Estimator Workbook

CP-VEW2

Version 1.0

2- Bin Method

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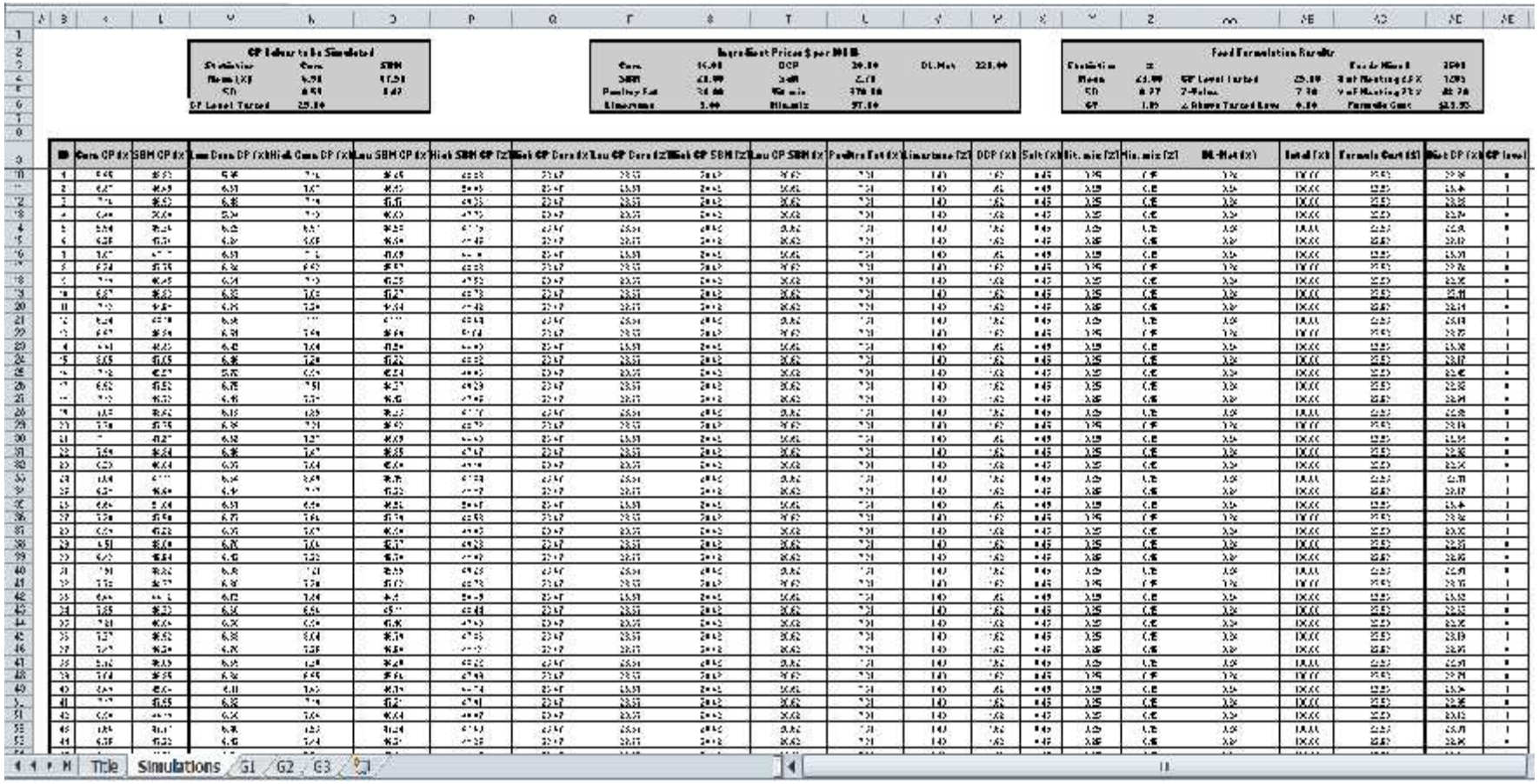
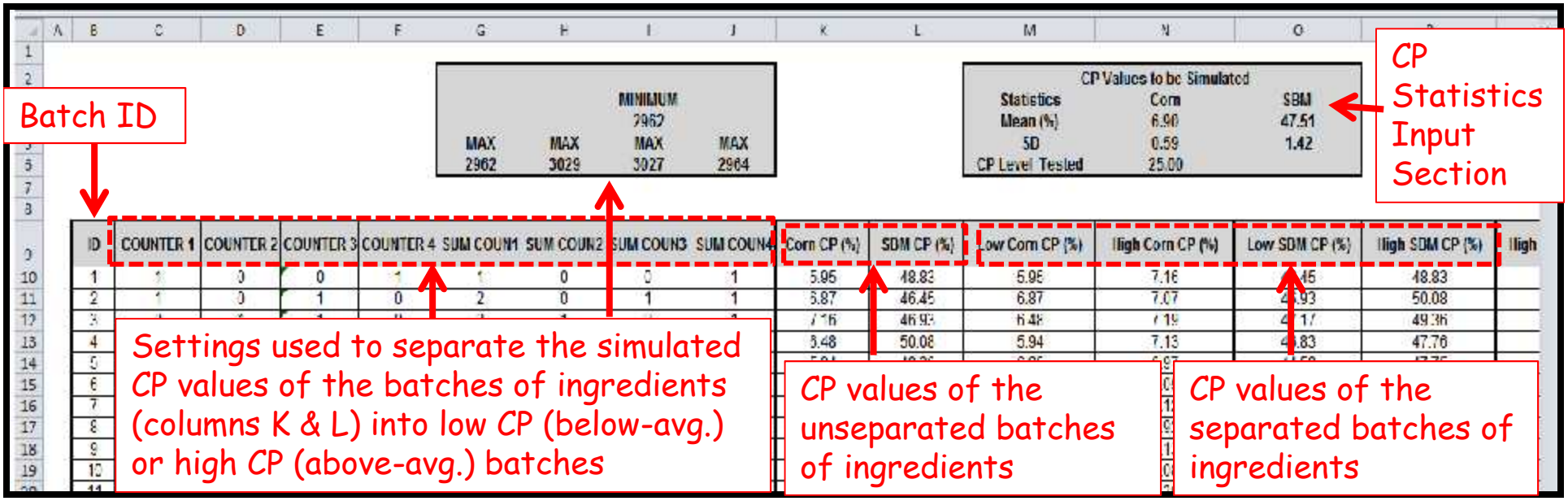
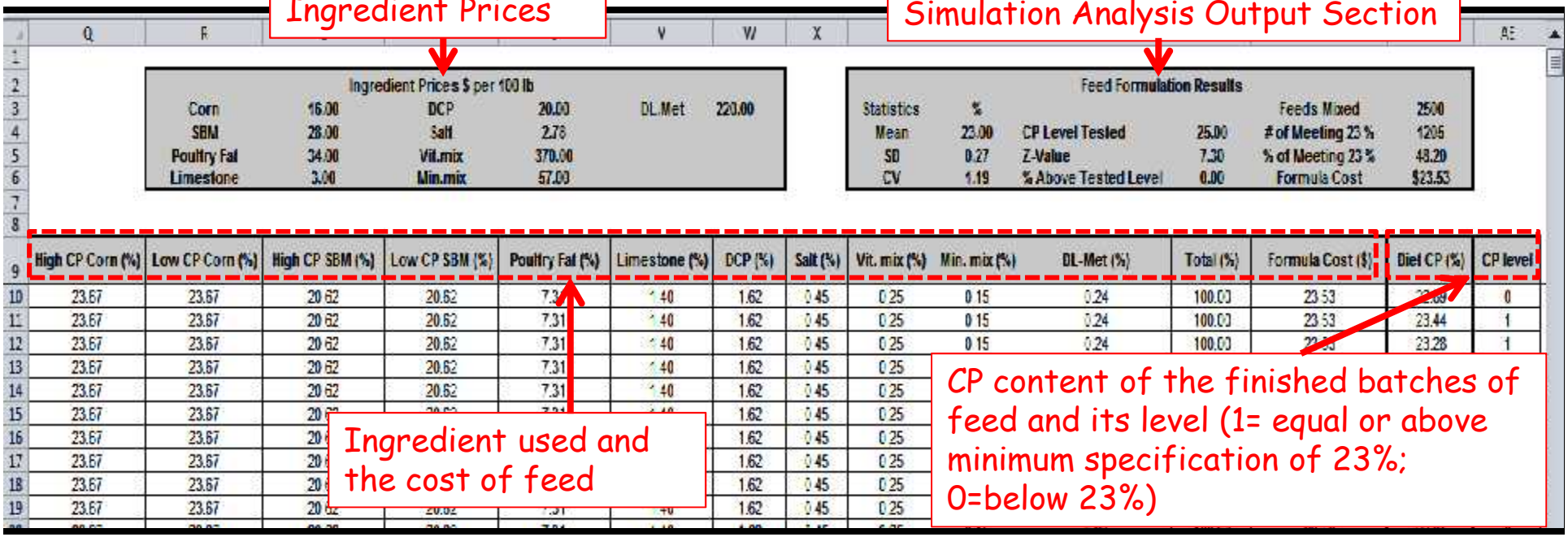
Tutorial

This PDF file shows you how to use CP-VEW2.xlsx Workbook to calculate measures of crude protein variability in finished feed formulated by the 2-Bin Method using simulation analysis.



CP-VEW2.xlsx Tool Overview





4 Steps to calculate measures of crude protein variability in feed using CP-VEW2.xlsx Workbook

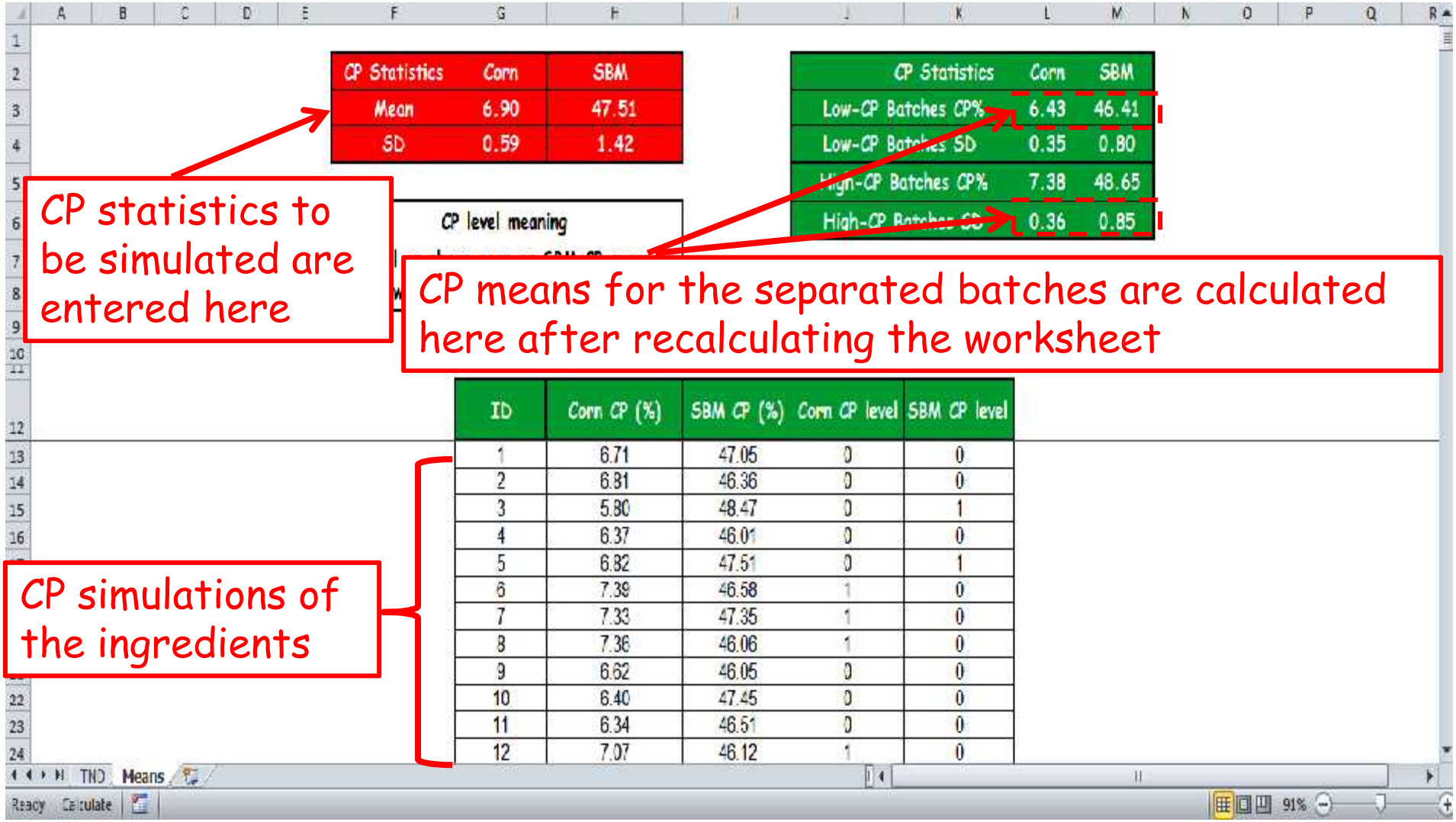
Step 1- Calculate CP means for below- and above-average batches for each ingredient using the workbook TND Calculator.xlsx.

Step 2- Formulate feed using the calculated CP means from step 1.

Step 3- Generate CP simulations using the mean and SD of CP.

Step 4- Calculate the measures of crude protein variability of the finished feed.

Step 1- Calculate CP means for below- and above-average batches for each ingredient using the workbook TND Calculator.xlsx.



CP Statistics	Corn	SBM
Mean	6.90	47.51
SD	0.59	1.42

CP Statistics	Corn	SBM
Low-CP Batches CP%	6.43	46.41
Low-CP Batches SD	0.35	0.80
High-CP Batches CP%	7.38	48.65
High-CP Batches SD	0.36	0.85

CP level meaning

CP statistics to be simulated are entered here

CP means for the separated batches are calculated here after recalculating the worksheet

ID	Corn CP (%)	SBM CP (%)	Corn CP level	SBM CP level
1	6.71	47.05	0	0
2	6.81	46.36	0	0
3	5.80	48.47	0	1
4	6.37	46.01	0	0
5	6.82	47.51	0	1
6	7.39	46.58	1	0
7	7.33	47.35	1	0
8	7.36	46.06	1	0
9	6.62	46.05	0	0
10	6.40	47.45	0	0
11	6.34	46.51	0	0
12	7.07	46.12	1	0

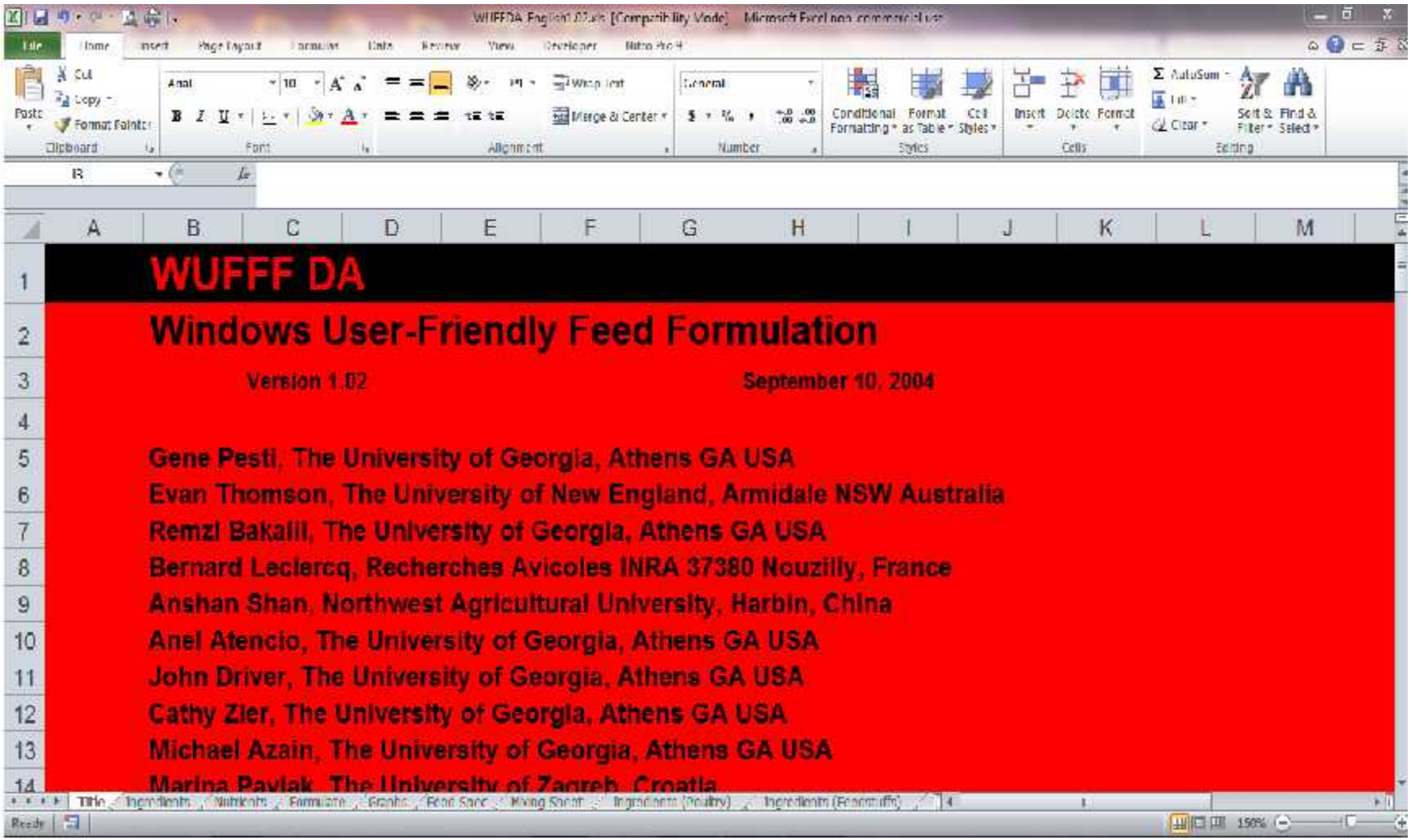
CP simulations of the ingredients

TND Means

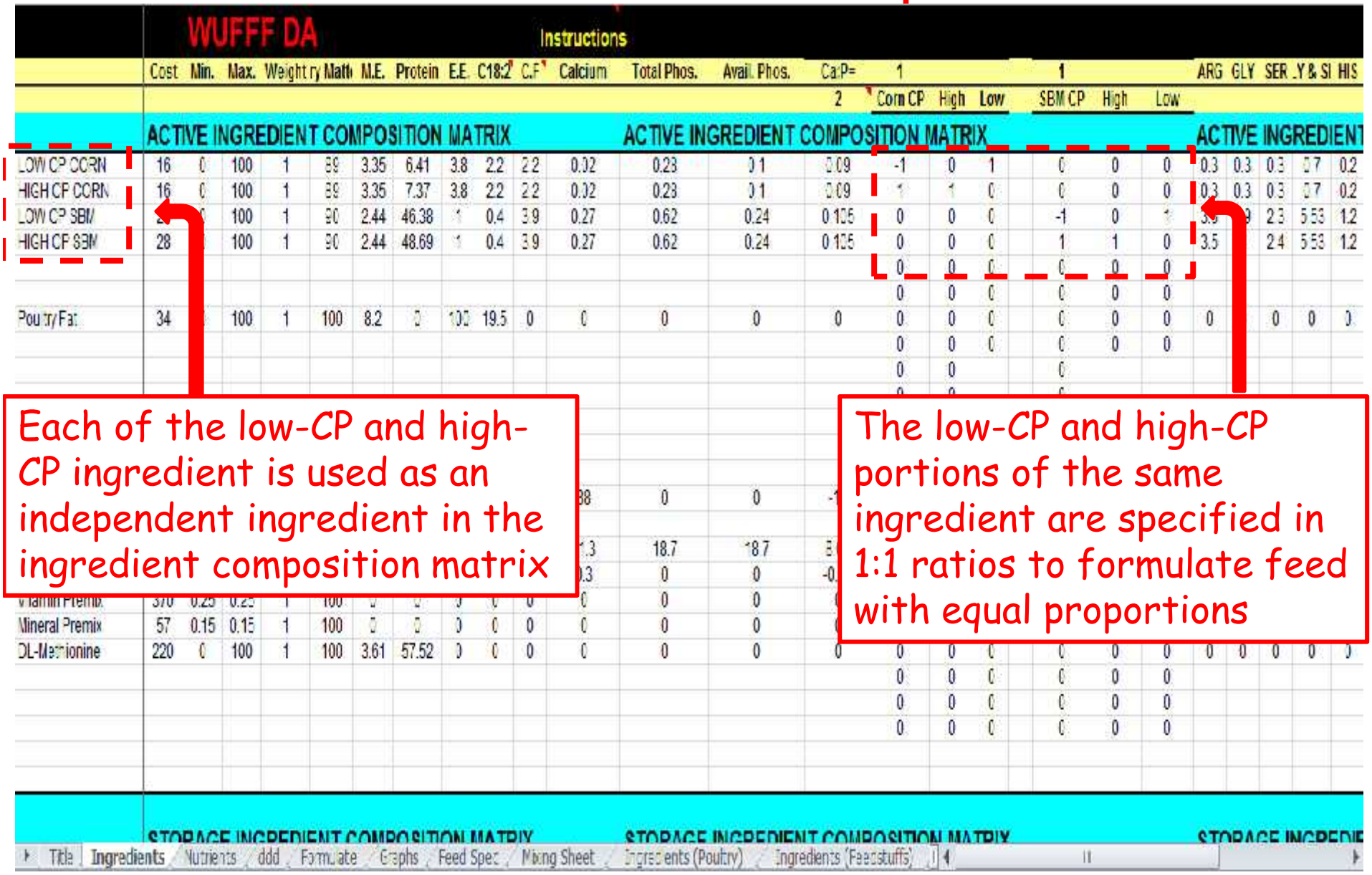
Ready Calculate

91%

The ingredient amounts of the feed formulated with the CP values of interest can be obtained using WUFFFDA Workbook



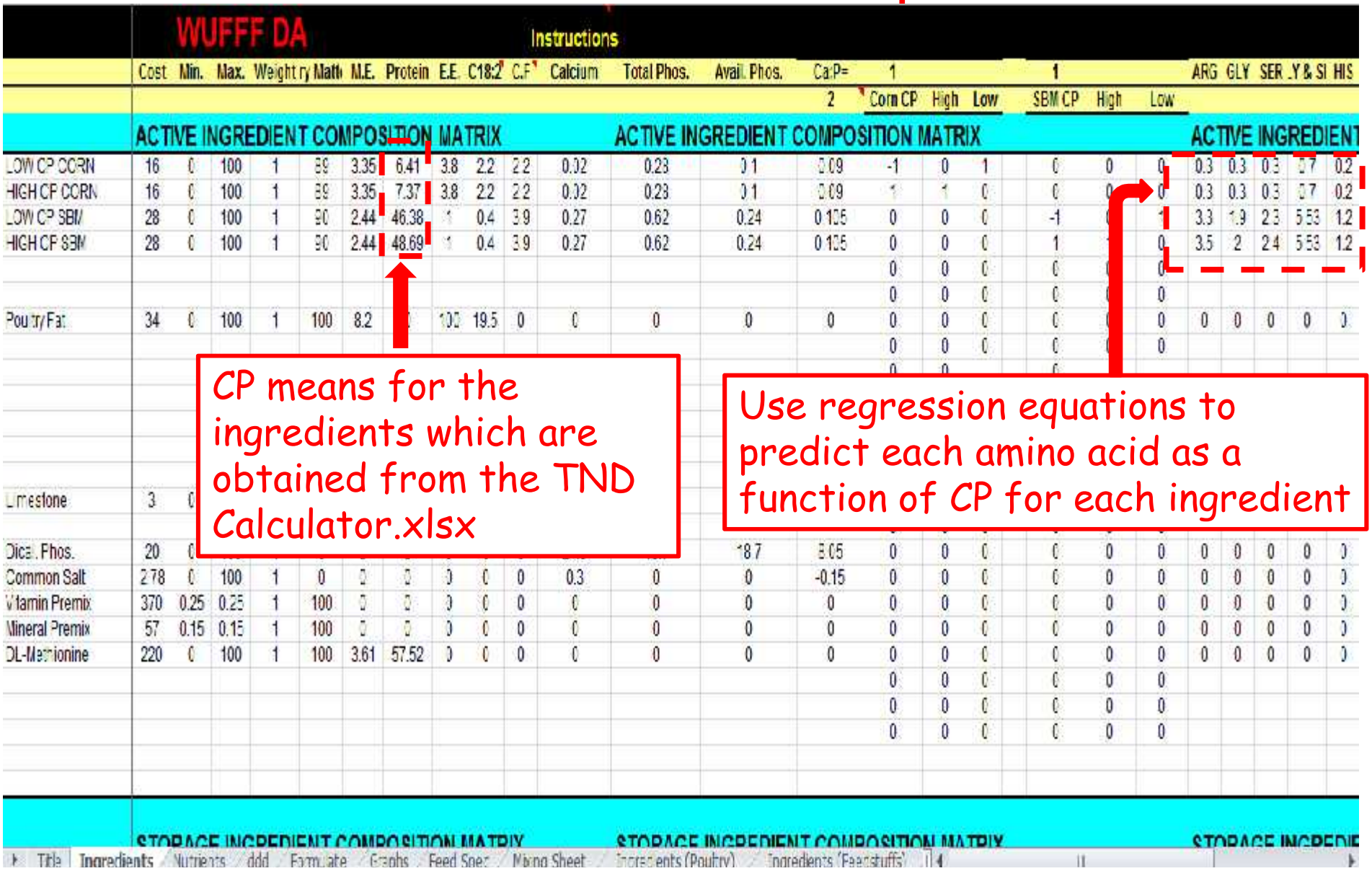
Step 2- Formulate feed using the calculated CP means from step 1.



Each of the low-CP and high-CP ingredient is used as an independent ingredient in the ingredient composition matrix

The low-CP and high-CP portions of the same ingredient are specified in 1:1 ratios to formulate feed with equal proportions

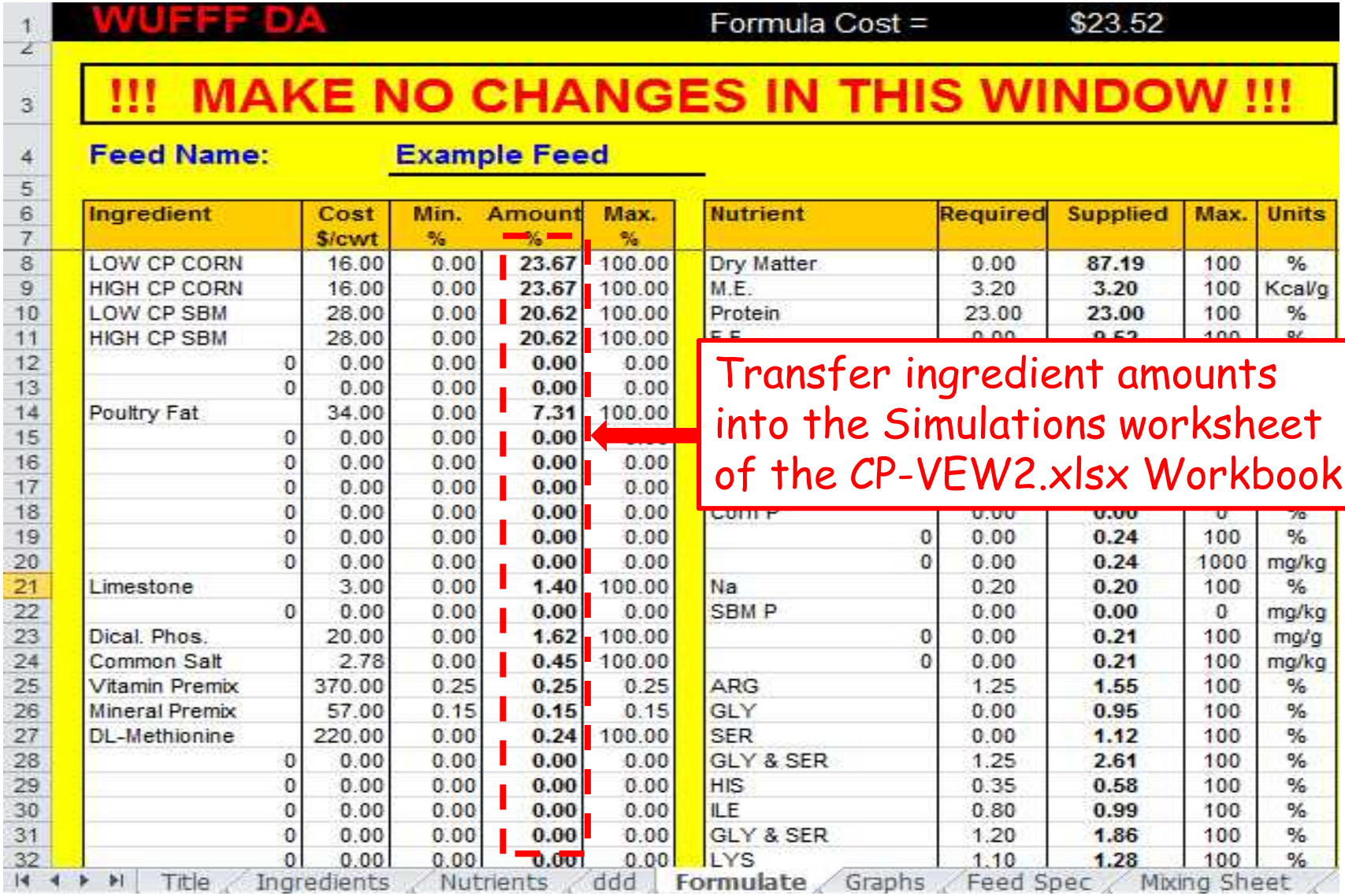
Step 2- Formulate feed using the calculated CP means from step 1.



CP means for the ingredients which are obtained from the TND Calculator.xlsx

Use regression equations to predict each amino acid as a function of CP for each ingredient

Step 2- Formulate feed using the calculated CP means from step 1.



WUFFF DA — Formula Cost = $23.52

!!! MAKE NO CHANGES IN THIS WINDOW !!!

Feed Name: Example Feed

Ingredient	Cost $/cwt	Min. %	Amount %	Max. %
LOW CP CORN	16.00	0.00	23.67	100.00
HIGH CP CORN	16.00	0.00	23.67	100.00
LOW CP SBM	28.00	0.00	20.62	100.00
HIGH CP SBM	28.00	0.00	20.62	100.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
Poultry Fat	34.00	0.00	7.31	100.00
0	0.00	0.00	0.00	
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
Limestone	3.00	0.00	1.40	100.00
0	0.00	0.00	0.00	0.00
Dical. Phos.	20.00	0.00	1.62	100.00
Common Salt	2.78	0.00	0.45	100.00
Vitamin Premix	370.00	0.25	0.25	0.25
Mineral Premix	57.00	0.15	0.15	0.15
DL-Methionine	220.00	0.00	0.24	100.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00

Nutrient	Required	Supplied	Max.	Units
Dry Matter	0.00	87.19	100	%
M.E.	3.20	3.20	100	Kcal/g
Protein	23.00	23.00	100	%
0	0.00	0.24	100	%
0	0.00	0.24	1000	mg/kg
Na	0.20	0.20	100	%
SBM P	0.00	0.00	0	mg/kg
0	0.00	0.21	100	mg/g
0	0.00	0.21	100	mg/kg
ARG	1.25	1.55	100	%
GLY	0.00	0.95	100	%
SER	0.00	1.12	100	%
GLY & SER	1.25	2.61	100	%
HIS	0.35	0.58	100	%
ILE	0.80	0.99	100	%
GLY & SER	1.20	1.86	100	%
LYS	1.10	1.28	100	%

Transfer ingredient amounts into the Simulations worksheet of the CP-VEW2.xlsx Workbook

Title | Ingredients | Nutrients | ddd | Formulate | Graphs | Feed Spec | Mixing Sheet

The amounts of the ingredients obtained from WUFFFDA Workbook

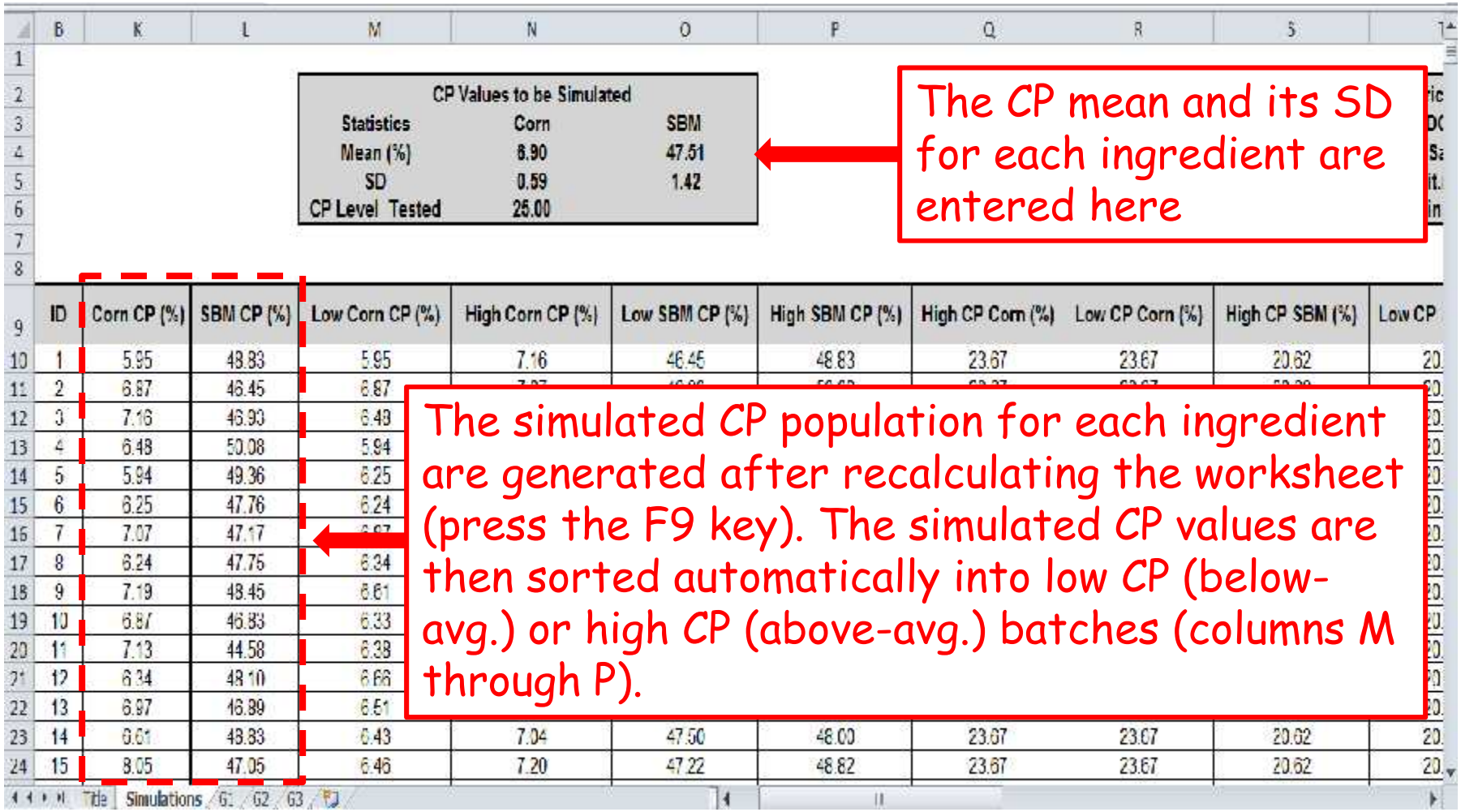
Ingredient Prices $ per 100 lb					
Corn	16.00	DCP	20.00	DL.Met	220.00
SBM	28.00	Salt	2.78		
Poultry Fat	34.00	Vit.mix	370.00		
Limestone	3.00	Min.mix	57.00		

Feed Formulation Results			
Statistics	%		
Mean	23.00	CP Level Tested	25.00
SD	0.27	Z-Value	7.39
CV	1.19	% Above Tested Level	0.00

	High CP Corn (%)	Low CP Corn (%)	High CP SBM (%)	Low CP SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL Met (%)	Total (%)
0	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
1	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
2	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
3	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
4	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
5	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
6	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
7	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
8	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
9	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
10	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
11	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
12	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
13	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
14	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
15	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
16	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30
17	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.30

Title | Simulations | G1 | G2 | G3

Step 3- Generate CP simulations using the mean and SD of CP.

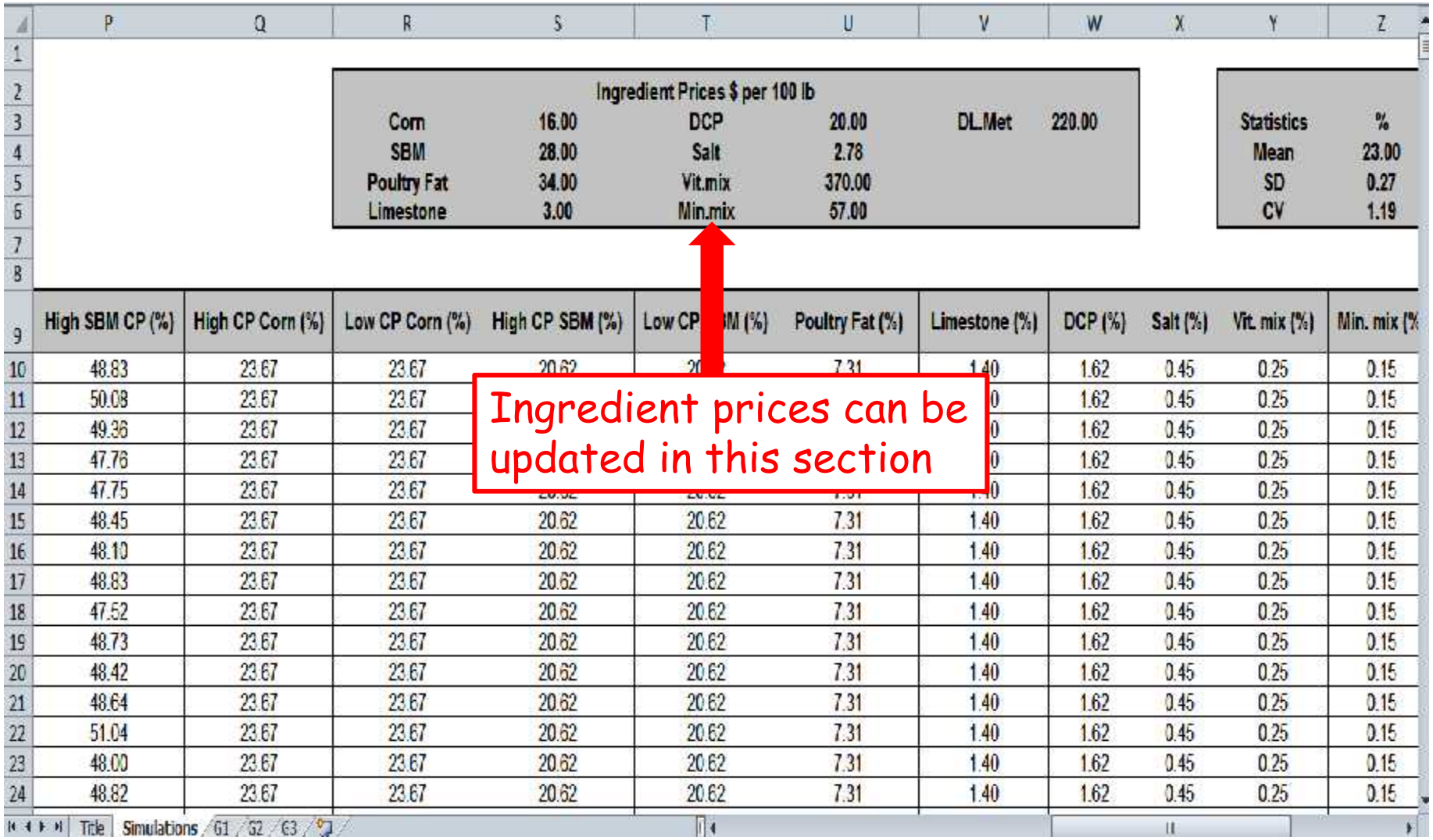


CP Values to be Simulated		
Statistics	Corn	SBM
Mean (%)	8.90	47.51
SD	0.59	1.42
CP Level Tested	25.00	

The CP mean and its SD for each ingredient are entered here

ID	Corn CP (%)	SBM CP (%)	Low Corn CP (%)	High Corn CP (%)	Low SBM CP (%)	High SBM CP (%)	High CP Corn (%)	Low CP Corn (%)	High CP SBM (%)	Low CP
1	5.85	48.83	5.85	7.16	46.45	48.83	23.67	23.67	20.62	20.
2	6.87	46.45	6.87							
3	7.16	48.93	6.49							
4	6.48	50.08	5.94							
5	5.94	49.36	6.25							
6	6.25	47.76	6.24							
7	7.07	47.17								
8	6.24	47.75	6.34							
9	7.19	48.45	6.61							
10	6.87	46.83	6.33							
11	7.13	44.58	6.38							
12	6.34	48.10	6.66							
13	6.97	46.89	6.51							
14	8.01	48.83	6.43	7.04	47.50	48.00	23.67	23.67	20.62	20.
15	8.05	47.05	6.46	7.20	47.22	48.82	23.67	23.67	20.62	20.

The simulated CP population for each ingredient are generated after recalculating the worksheet (press the F9 key). The simulated CP values are then sorted automatically into low CP (below-avg.) or high CP (above-avg.) batches (columns M through P).



Ingredient Prices $ per 100 lb					
Corn	16.00	DCP	20.00	DL.Met	220.00
SBM	28.00	Salt	2.78		
Poultry Fat	34.00	Vit.mix	370.00		
Limestone	3.00	Min.mix	57.00		

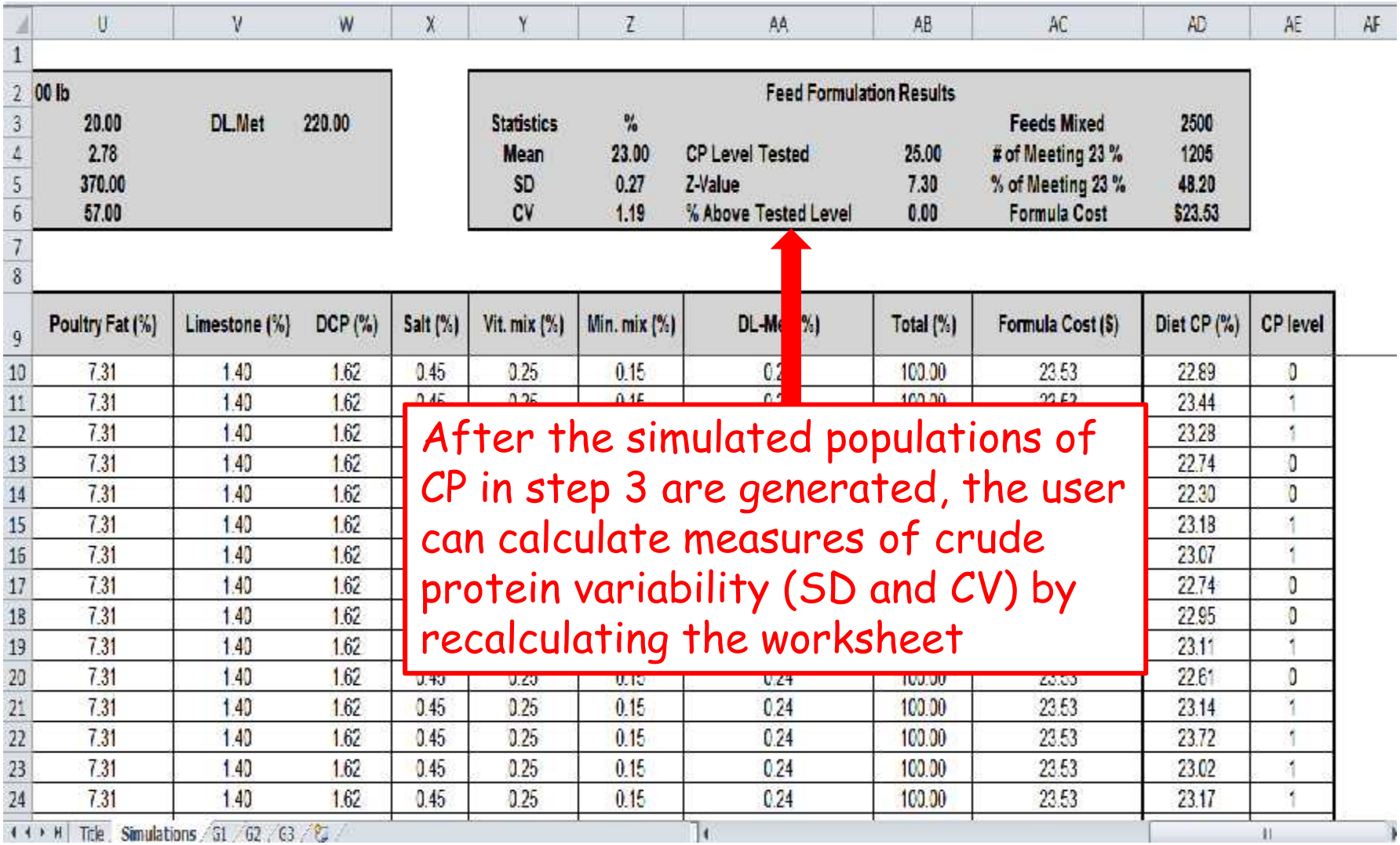
Statistics	%
Mean	23.00
SD	0.27
CV	1.19

High SBM CP (%)	High CP Corn (%)	Low CP Corn (%)	High CP SBM (%)	Low CP M (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%
48.83	23.67	23.67	20.62		7.31	1.40	1.62	0.45	0.25	0.15
50.08	23.67	23.67				0	1.62	0.45	0.25	0.15
49.36	23.67	23.67				0	1.62	0.45	0.25	0.15
47.76	23.67	23.67				0	1.62	0.45	0.25	0.15
47.75	23.67	23.67				0	1.62	0.45	0.25	0.15
48.45	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
48.10	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
48.83	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
47.52	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
48.73	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
48.42	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
48.64	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
51.04	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
48.00	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15
48.82	23.67	23.67	20.62	20.62	7.31	1.40	1.62	0.45	0.25	0.15

Ingredient prices can be updated in this section

Title | Simulations | G1 | G2 | G3

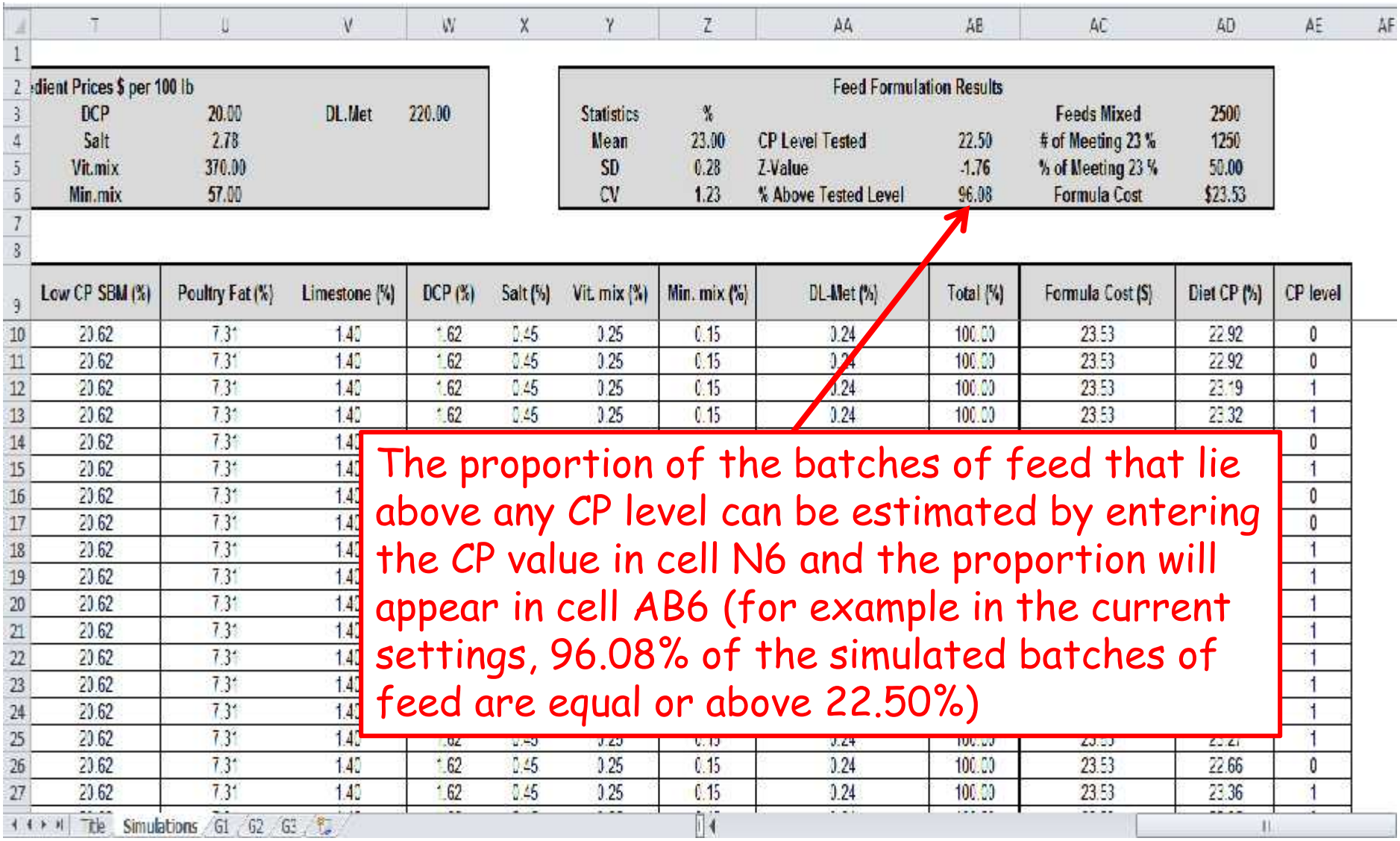
Step 4- Calculate the measures of crude protein variability of the finished feed.



	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1												
2	00 lb						Feed Formulation Results					
3	20.00	DL.Met	220.00			Statistics	%			Feeds Mixed	2500	
4	2.78					Mean	23.00	CP Level Tested	25.00	# of Meeting 23 %	1205	
5	370.00					SD	0.27	Z-Value	7.30	% of Meeting 23 %	48.20	
6	57.00					CV	1.19	% Above Tested Level	0.00	Formula Cost	$23.53	
7												
8												
9	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Me %)	Total (%)	Formula Cost ($)	Diet CP (%)	CP level	
10	7.31	1.40	1.62	0.45	0.25	0.15	0.2	100.00	23.53	22.89	0	
11	7.31	1.40	1.62							23.44	1	
12	7.31	1.40	1.62							23.28	1	
13	7.31	1.40	1.62							22.74	0	
14	7.31	1.40	1.62							22.30	0	
15	7.31	1.40	1.62							23.18	1	
16	7.31	1.40	1.62							23.07	1	
17	7.31	1.40	1.62							22.74	0	
18	7.31	1.40	1.62							22.95	0	
19	7.31	1.40	1.62							23.11	1	
20	7.31	1.40	1.62							22.61	0	
21	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.14	1	
22	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.72	1	
23	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.02	1	
24	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.17	1	

Title | Simulations | G1 | G2 | G3

After the simulated populations of CP in step 3 are generated, the user can calculate measures of crude protein variability (SD and CV) by recalculating the worksheet



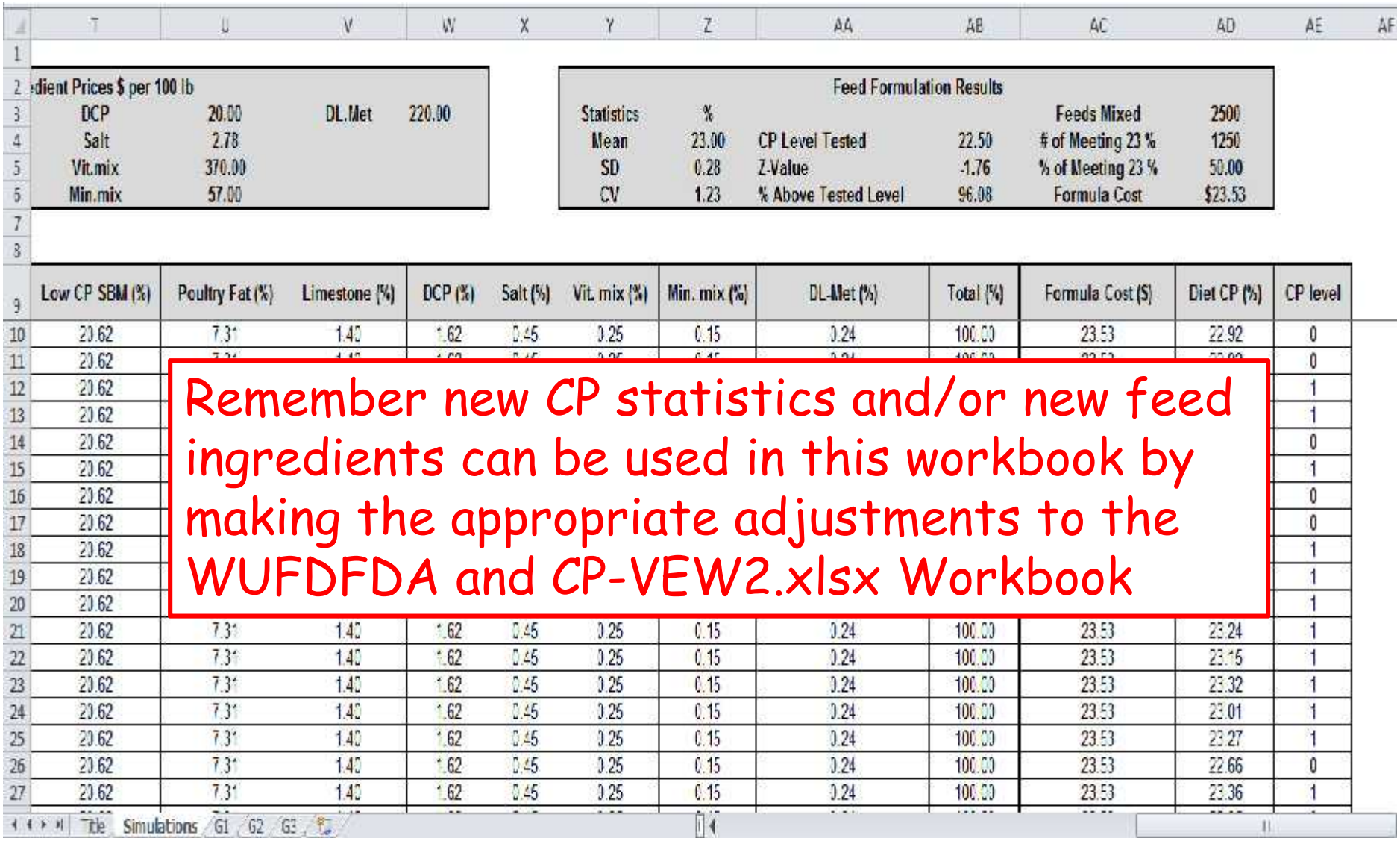
	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
1													
2	dient Prices $ per 100 lb												
3	DCP	20.00	DL.Met	220.00									
4	Salt	2.78											
5	Vit.mix	370.00											
6	Min.mix	57.00											
7													
8													

Feed Formulation Results					
Statistics	%			Feeds Mixed	2500
Mean	23.00	CP Level Tested	22.50	# of Meeting 23 %	1250
SD	0.28	Z-Value	-1.76	% of Meeting 23 %	50.00
CV	1.23	% Above Tested Level	96.08	Formula Cost	$23.53

9	Low CP SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	Formula Cost ($)	Diet CP (%)	CP level
10	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	22.92	0
11	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	22.92	0
12	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.19	1
13	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.32	1
14	20.62	7.31	1.40									0
15	20.62	7.31	1.40									1
16	20.62	7.31	1.40									0
17	20.62	7.31	1.40									0
18	20.62	7.31	1.40									1
19	20.62	7.31	1.40									1
20	20.62	7.31	1.40									1
21	20.62	7.31	1.40									1
22	20.62	7.31	1.40									1
23	20.62	7.31	1.40									1
24	20.62	7.31	1.40									1
25	20.62	7.31	1.40									1
26	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	22.66	0
27	20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.36	1

Title | Simulations | G1 | G2 | G3

The proportion of the batches of feed that lie above any CP level can be estimated by entering the CP value in cell N6 and the proportion will appear in cell AB6 (for example in the current settings, 96.08% of the simulated batches of feed are equal or above 22.50%)



edient Prices $ per 100 lb			
DCP	20.00	DL.Met	220.00
Salt	2.78		
Vit.mix	370.00		
Min.mix	57.00		

Feed Formulation Results					
Statistics	%			Feeds Mixed	2500
Mean	23.00	CP Level Tested	22.50	# of Meeting 23 %	1250
SD	0.28	Z-Value	-1.76	% of Meeting 23 %	50.00
CV	1.23	% Above Tested Level	96.08	Formula Cost	$23.53

Low CP SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	Formula Cost ($)	Diet CP (%)	CP level
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	22.92	0
20.62											0
20.62											1
20.62											1
20.62											0
20.62											1
20.62											0
20.62											0
20.62											1
20.62											1
20.62											1
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.24	1
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.15	1
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.32	1
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.01	1
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.27	1
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	22.66	0
20.62	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.53	23.36	1

Title | Simulations | G1 | G2 | G3

Remember new CP statistics and/or new feed ingredients can be used in this workbook by making the appropriate adjustments to the WUFDFDA and CP-VEW2.xlsx Workbook