

Crude Protein Variation Estimator Workbook

CP-VEW1

Version 1.0

1- Bin Method

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Tutorial

This PDF file shows you how to use CP-VEW1.xlsx Workbook to calculate measures of crude protein variability in finished feed formulated by the standard 1-Bin Method using simulation analysis.

CP Values to be Simulated			Ingredient Prices \$ per 100 lb				Feed Formulation Results								
Statistics	Corn	SBM	Corn	DCP	DL-Met	Statistics	%	CP Level Tested	23.50	Feeds Mixed	10,000				
Mean (%)	6.90	47.51	SBM	Salt	2.78	Mean	23.00	Z-Value	0.76	% of Meeting 23%	49.87				
SD	0.59	1.42	Poultry Fat	Vit. mix	370.00	SD	0.66	% Above Tested Level	22.41	Formula Cost	\$23.53				
CP Level Tested	23.50		Limestone	Min. mix	57.00	CV	2.85								
ID	Corn CP (%)	SBM CP (%)	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	Formula Cost (\$)	Diet CP (%)	CP level
1	6.77	45.46	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.53	1
2	6.33	45.06	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.19	1
3	7.55	45.27	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.62	1
4	6.5	47.50	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.98	0
5	6.53	47.54	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.03	1
6	6.50	45.19	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	21.85	0
7	7.35	44.71	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.21	0
8	7.77	45.79	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.12	1
9	6.39	45.78	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.74	0
10	6.33	50.12	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	24.12	1
11	7.75	45.76	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.41	0
12	6.6	45.35	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.21	1
13	7.45	47.31	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.06	1
14	7.43	45.68	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.64	1
15	6.30	47.63	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.08	1
16	6.35	48.31	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.60	1
17	6.7	47.07	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.48	0
18	6.39	45.09	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.14	1
19	7.42	47.31	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.29	1
20	6.35	45.35	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.79	0
21	7.05	45.32	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.31	1
22	7.35	45.54	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	21.45	1
23	7.23	45.63	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.60	0
24	7.0	45.43	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.45	1
25	7.03	45.69	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.55	1
26	6.35	45.58	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.19	0
27	6.33	45.64	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	22.76	0
28	6.43	45.90	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.38	1
29	7.47	45.64	47.53	41.25	7.31	1.40	1.62	0.45	0.25	0.75	3.24	100.00	23.53	23.62	1

CP-VEW1.xlsx Tool Overview

CP Statistics Input Section

Ingredient Prices

Simulation Analysis Output Section

CP Values to be Simulated			Ingredient Prices \$ per 100 lb					Feed Formulation Results							
Statistics	Corn	SBM	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	Formula Cost (\$)	Diet CP (%)	CP level
Mean (%)	6.90	47.51	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.53	1
SD	0.59	1.42	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.19	1
CP Level Tested	23.50		47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.62	1
			47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.98	0
			47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.03	1
			47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	21.85	0
			47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.21	0
			47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.12	1

Batch ID	Corn CP (%)	SBM CP (%)	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	Formula Cost (\$)	Diet CP (%)	CP level
8	6.77	45.46	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.53	1
9	6.33	45.06	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.19	1
10	7.55	45.87	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.62	1
11	6.5	47.9	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.98	0
12	6.33	47.54	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.03	1
13	6.53	45.19	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	21.85	0
14	7.55	46.71	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.21	0
15	7.77	45.79	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.12	1
16	6.6	47.01	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.48	1
17	7.45	45.88	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.14	1
18	7.49	45.88	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.29	1
19	6.33	47.63	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
20	6.35	48.31	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.31	1
21	6.7	47.07	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.48	0
22	6.33	45.09	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.14	1
23	7.42	47.31	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	23.29	1
24	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
25	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
26	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
27	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
28	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
29	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
30	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
31	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
32	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
33	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
34	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
35	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
36	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
37	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
38	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
39	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
40	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
41	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
42	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
43	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
44	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
45	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
46	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
47	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
48	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
49	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0
50	6.33	45.65	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	25.53	22.79	0

Batch ID

CP simulations for the ingredients

Ingredients used and cost of the feed

CP content of the finished batches of feed and its level (1= equal or above minimum specification of 23%; 0=below 23%)

Workbook Title

Simulations worksheet

Graph Outputs

Ready Calculate | Title Simulations | G1 G2 G3

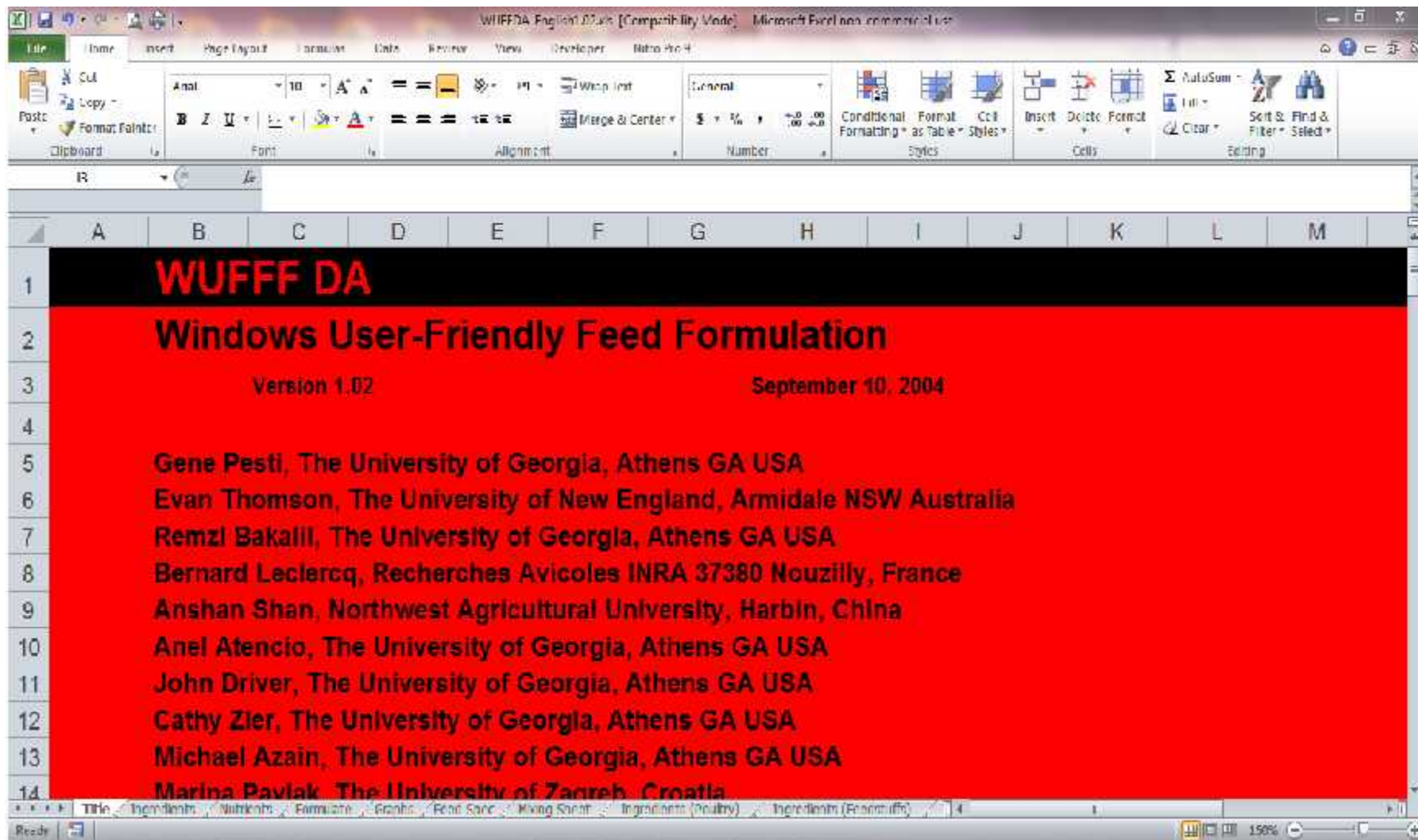
3 Steps to calculate measures of crude protein variability in feed using CP-VEW1.xlsx Workbook

Step 1- Formulate feed using CP values of interest of the ingredients.

Step 2- Generate CP simulations using the mean and SD of CP.

Step 3- Calculate the measures of crude protein variability of the finished feed.

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



Step 1- Formulate feed using CP values of interest of the ingredients.

	E	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI								
WUFF DA																																									
Instructions																																									
Cost	Min.	Max.	Weight	Mat	M.E.	Protein	E.E.	C18	Z	C.F	Calcium	Total Phos.	Avail. Phos	Ca:P=	K	Cl	Mn	Na	Zn	Choline	Folate	ARG	GLY	SER	Y	&	S	HIS	ILE	LEU	LYS	MET	CYST	SAR	PHE						
2																																									
ACTIVE INGREDIENT COMPOSITION MATRIX																ACTIVE INGREDIENT COMPOSITION MATRIX																ACTIVE INGREDIENT COMPOSITION MATRIX									
Com. Gran	15	0	100	1	85	3.55	3.9	3.8	2.2	2.2	1.02	1.23	0.1	1.09	0.3	0.04	3	1.02	10	0.62	0.4	0.3	0.3	1.7	1.2	0.2	0.79	1.2	0.14	0.1	0.29	1.3									
Soybean Meal-48%	28	0	100	1	92	2.44	4.75	1	0.4	1.9	1.27	1.62	0.24	0.105	2.02	0.05	45	1.03	45	2.7	0.7	3.4	2	2.3	5.53	12	2.1	3.6	2.88	0.62	1.7	1.25	2.4								
Poultry Fat	34	0	100	1	100	3.2	10	19.5	0				0									0																			
Limestone	3	0	100	1		0	0	0	0	0	38		0	-18	0																										
Dical Phos.	20	0	100	1		0	0	0	0	0	213	18.7	18.7	3.05	0																										
Common Salt	2.78	0	100	1		0	0	0	0	0	0.3		0	-1.5	0																										
Vitamin Premix	170	0.25	1.25	1	100	0	0	0	0	0				0																											
Mineral Premix	57	0.15	0.15	1	100	0	0	0	0	0				0																											
DL-Methionine	220	0	100	1	100	3.31	57.52	0	0	0				0																											

CP values of interest

Use the right amino acid content corresponding to the CP value of the ingredient. Regression equations may be used here to predict each amino acid as a function of CP if amino acid content is unknown

Step 1- Formulate feed using CP values of interest of the ingredients.

WUFFF DA					Formula Cost =		\$23.53	
!!! MAKE NO CHANGES IN THIS WINDOW !!!								
Feed Name:		Example Feed						
Ingredient	Cost \$/cwt	Min. %	Amount %	Max. %	Nutrient	Required	Supplied	Max. Units
Corn, Grain	16.00	0.00	47.33	100.00	Dry Matter	0.00	87.19	100 %
	0.00	0.00	0.00	0.00	M.E.	3.20	3.20	100 Kcal/g
	0.00	0.00	0.00	0.00	Protein	23.00	23.00	100 %
	0.00	0.00	0.00	0.00	E.E.	0.00	9.52	100 %
Soybean Meal -48%	28.00	0.00	41.25	100.00	C18:2	1.00	2.63	100 %
	0.00	0.00	0.00	0.00				
Poultry Fat	34.00	0.00	7.31	100.00				
	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00				
Limestone	3.00	0.00	1.40	100.00				
	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				
	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00				
	0.00	0.00	0.00	0.00				
TOTAL			100.00					

Nutrient	Required	Supplied	Max. Units
Na	0.20	0.20	100 %
Zn	40.00	204.92	1000 mg/kg
Choline	1.30	1.64	100 mg/g
Folate	0.55	2.22	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 %
MET	0.50	0.56	100 %
CYS	0.00	0.34	100 %
TSAA	0.90	0.90	100 %

Transfer the ingredient amounts into the Simulations worksheet of the CP-VEW1.xlsx Workbook

The amounts of the ingredients obtained from WUFFFDA Workbook appear in each row of the Simulations worksheet.

CP Values to be Simulated			Ingredient Prices \$ per 100 lb								Statistics		CP Le
Statistics	Corn	SBM	Corn	16.00	DCP	20.00	DL.Met	220.00				%	
Mean (%)	6.90	47.51	SBM	28.00	Salt	2.78					Mean	23.00	CP Le
SD	0.59	1.42	Poultry Fat	34.00	Vit. mix	370.00					SD	0.66	Z-Val
CP Level Tested	23.50		Limestone	3.00	Min. mix	57.00					CV	2.85	% Abc
ID	Corn CP (%)	SBM CP (%)	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	
1	6.77	48.46	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
2	6.83	48.06	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
3	7.55	48.27	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
4	6.51	47.90	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
5	6.58	47.94	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
6	6.50	45.19	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
7	7.66	44.71	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
8	7.77	46.79	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
9	6.99	46.78	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
10	6.98	50.12	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
11	7.19	45.76	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
12	6.61	48.35	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
13	7.45	47.01	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
14	7.49	48.88	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
15	6.80	47.83	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
16	6.95	48.91	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	
17	6.17	47.07	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	

Step 2- Generate CP simulations using the mean and SD of CP.

CP Values to be Simulated			Ingredient Prices \$ per 100 lb								Statistics			
Statistics	Corn	SBM	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	%	CP Le
Mean (%)	6.90	47.51	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	23.00	CP Le
SD	0.59	1.42	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	0.66	Z-Valu
CP Level Tested		23.50	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00	2.85	% Abc

ID	Corn CP (%)	SBM CP (%)	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)
1	6.77	48.46	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
2	6.83	48.06	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
3	7.55	48.27	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
4	6.51	47.90	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
5	6.58	47.94	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
6	6.50	45.19	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
7	7.66	44.71	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
8	7.77	46.79	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
9	6.99	46.78	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
10	6.98	50.12	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
11	7.19	45.76	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
12	6.61	48.35	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
13	7.45	47.01	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
14	7.49	48.88	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
15	6.80	47.83	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
16	6.95	48.91	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
17	6.17	47.07	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00

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

The simulated CP values for each ingredient are generated after recalculating the worksheet (press the F9 key).

CP Values to be Simulated			Ingredient Prices \$ per 100 lb								Statistics		
Statistics	Corn	SBM	Corn	16.00	DCP	20.00	DL.Met	220.00	Statistics	%	CP Le		
Mean (%)	6.90	47.51	SBM	28.00	Salt	2.78			Mean	23.00	CP Le		
SD	0.59	1.42	Poultry Fat	34.00	Vit. mix	370.00			SD	0.66	Z-Valu		
CP Level Tested		23.50	Limestone	3.00	Min. mix	57.00			CV	2.85	% Abc		

ID	Corn CP (%)	SBM CP (%)	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)
1	6.77	48.46	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
2	6.83	48.06	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
3	7.55	48.27	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
4	6.51	47.90	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
5	6.58	47.94	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
6	6.50	45.19	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
7	7.66	44.71	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
8	7.77	46.79	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
9	6.99	46.78	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
10	6.98	50.12	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
11	7.19	45.76	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
12	6.61	48.35	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
13	7.45	47.01	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
14	7.49	48.88	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
15	6.80	47.33	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
16	6.95	48.91	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00
17	6.17	47.07	47.33	41.25	7.31	1.40	1.62	0.45	0.25	0.15	0.24	100.00

Ingredient prices can be updated in this section

CP Values to be Simulated		Ingredient Prices \$ per 100 lb				Feed Formulation Results								
Statistics	Corn	SBM	Corn	16.00	DCP	20.00	DL Met	220.00	Statistics	%	Feeds Mixed		10,000	
Mean (%)	6.90	47.51	SBM (%)	28.00	Salt	2.78			Mean	23.00	CP Level Tested	23.50	# of Meeting 23%	4,987
SD	0.59	1.42	Poultry Fat (%)	34.00	Vit. mix	370.00			SD	0.66	Z-Value	0.76	% of Meeting 23 %	49.87
CP Level Tested	23.50		Limestone (%)	3.00	Min. mix	57.00			CV	2.85	% Above Tested Level	22.41	Formula Cost	\$23.53

ID	Corn CP (%)	SBM CP (%)	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	Formula Cost (\$)	Diet CP (%)	CP level
1	6.77	46.46	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.55	1
2	6.35	46.06	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.19	1
3	7.55	46.27	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.52	1
4	6.51	47.90	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	22.56	0
5	6.55	47.94	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.55	1
6	6.50	45.19	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	2.85	0
7	7.35	47.71	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	22.21	0
8	7.77	46.79	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.12	1
9	6.35	46.78	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	22.74	0
10	6.35	50.12	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	24.12	1
11	7.19	45.76	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	22.41	0
12	6.61	46.35	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.21	1
13	7.45	47.21	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.56	1
14	7.45	46.88	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.54	1
15	6.30														1
16	6.35														1
17	6.77														0
18	6.35														1
19	7.42														1
20	6.35														0
21	7.05														1
22	7.35														1
23	7.25														0
24	7.04														1
25	7.05														1
26	6.35														0
27	6.35														0
28	6.45														1
29	7.47	46.84	47.33	41.25	7.31	1.40	162	1.45	0.25	0.15	1.24	100.00	23.53	23.52	1

The proportion of the batches of feed that lie above any CP level can be estimated by entering the CP value in cell D6 and the proportion will appear in cell P6 (for example in the current settings, 22.41% of the simulated batches of feed are equal or above 23.50%).

CP Values to be Simulated		
Statistics	Corn	SBM
Mean (%)	6.90	47.51
SD	0.59	1.42
CP Level Tested	23.50	

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	%			Feeds Mixed 10,000
Mean	23.00	CP Level Tested	23.50	# of Meeting 23% 4,987
SD	0.66	Z-Value	0.76	% of Meeting 23 % 49.87
CV	2.85	% Above Tested Level	22.41	Formula Cost \$23.53

ID	Corn CP (%)	SBM CP (%)	Corn (%)	SBM (%)	Poultry Fat (%)	Limestone (%)	DCP (%)	Salt (%)	Vit. mix (%)	Min. mix (%)	DL-Met (%)	Total (%)	Formula Cost (\$)	Diet CP (%)	CP level
1	6.77	46.46	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.53	1
2	6.35	46.06	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.19	1
3	7.55	46.27	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.52	1
4	6.51	47.90	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	22.52	0
5	6.55	47.94	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.53	1
6	6.77	46.46	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.53	1
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26	6.35	46.09	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.14	1
27	7.42	47.51	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.25	1
28	6.95	46.95	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	22.75	0
29	7.05	46.32	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.81	1
30	7.35	46.94	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	24.45	1
31	7.25	46.63	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	22.50	0
32	7.34	46.43	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.45	1
33	7.05	46.59	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.55	1
34	6.35	46.58	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	22.19	0
35	6.35	46.84	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	22.76	0
36	6.45	46.90	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.35	1
37	7.47	46.84	47.53	47.25	7.31	1.40	162	3.45	0.25	0.15	2.24	100.00	23.53	23.52	1

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-VEW1.xlsx Workbook.