

SUMMARY TABLE: CORN [MAIZE], CORN DDGS AND SBM

SAMPLE	CROP YEAR ‡	STATISTIC	DM	CP	CP (100% DM)	----- as-is basis -----								
						LYS	THR	MET	CYS	M+C	ARG	ILE	VAL	TRP
CORN	2007/ 2008	MEAN	88.32	8.12	9.20	0.26	0.29	0.17	0.17	0.34	0.40	0.27	0.37	0.06
		STDEV	1.13	0.48	0.52	0.02	0.02	0.02	0.01	0.03	0.03	0.02	0.03	0.01
		Observations	87	87	87	87	87	87	87	87	87	87	87	87
	2008/ 2009	MEAN	88.65	7.50	8.46	0.24	0.26	0.16	0.15	0.31	0.37	0.24	0.34	0.06
		STDEV	1.62	0.93	1.02	0.04	0.03	0.03	0.02	0.04	0.05	0.03	0.04	0.01
		Observations	82	82	82	82	82	82	82	82	82	82	82	82
	2009/ 2010	MEAN	88.35	7.17	8.11	0.22	0.26	0.17	0.15	0.32	0.36	0.24	0.33	0.06
		STDEV	1.68	0.67	0.70	0.02	0.02	0.03	0.02	0.04	0.04	0.02	0.03	0.01
		Observations	205	205	205	205	205	205	205	205	205	205	205	205
	2010/ 2011	MEAN	88.50	7.47	8.43	0.24	0.28	0.20	0.17	0.37	0.39	0.26	0.37	0.06
		STDEV	1.41	0.89	0.93	0.02	0.03	0.03	0.02	0.05	0.06	0.03	0.04	0.01
		Observations	173	169	169	151	151	151	151	151	151	151	151	169
DDGS	2007/ 2008	MEAN	89.60	27.11	30.25	0.87	1.02	0.56	0.49	1.05	1.28	1.00	1.32	0.21
		STDEV	1.53	3.38	3.63	0.15	0.14	0.11	0.08	0.18	0.17	0.16	0.20	0.02
		Observations	227	227	227	227	227	227	227	227	227	227	227	227
	2008/ 2009	MEAN	89.19	26.64	29.87	0.88	0.99	0.54	0.48	1.02	1.22	0.96	1.27	0.21
		STDEV	1.36	2.11	2.29	0.09	0.09	0.06	0.05	0.11	0.10	0.11	0.13	0.01
		Observations	203	203	203	203	203	203	203	203	203	203	203	203
	2009/ 2010	MEAN	88.08	25.68	29.14	0.79	0.98	0.49	0.47	0.97	1.16	0.95	1.25	0.23
		STDEV	1.50	2.41	2.53	0.09	0.11	0.06	0.05	0.09	0.15	0.12	0.13	0.02
		Observations	142	142	142	142	142	142	142	142	142	142	142	142
	2010/ 2011	MEAN	87.81	25.62	29.22	0.84	0.99	0.50	0.50	1.01	1.18	0.97	1.34	0.23
		STDEV	1.90	1.43	1.56	0.07	0.07	0.04	0.04	0.08	0.12	0.08	0.12	0.02
		Observations	93	89	89	88	88	88	88	88	88	88	88	88
SBM	2007/ 2008	MEAN	89.78	47.98	53.45	3.01	1.87	0.68	0.66	1.34	3.50	2.20	2.24	0.62
		STDEV	1.07	1.75	2.00	0.14	0.09	0.05	0.04	0.07	0.17	0.12	0.12	0.03
		Observations	234	234	234	234	234	234	234	234	234	234	234	234
	2008/ 2009	MEAN	90.08	47.16	52.35	2.92	1.82	0.69	0.62	1.31	3.36	2.08	2.17	0.61
		STDEV	0.78	1.23	1.46	0.13	0.08	0.04	0.04	0.07	0.19	0.10	0.10	0.03
		Observations	237	237	237	237	237	237	237	237	237	237	237	237
	2009/ 2010	MEAN	89.92	47.05	52.33	2.88	1.84	0.64	0.63	1.27	3.42	2.09	2.16	0.64
		STDEV	1.14	1.10	1.31	0.09	0.06	0.05	0.04	0.06	0.25	0.07	0.10	0.04
		Observations	231	231	231	231	231	231	231	231	231	231	231	231
	2010/ 2011	MEAN	89.55	47.67	53.25	2.95	1.88	0.66	0.67	1.33	3.49	2.18	2.30	0.64
		STDEV	0.60	1.28	1.40	0.08	0.05	0.03	0.04	0.07	0.24	0.07	0.12	0.05
		Observations	179	167	167	167	167	167	167	167	167	167	167	167

‡ A crop year is defined as samples received October 1 of one year to September 30 of the following year [Ex. October 1, 2008 to September 30, 2009].

THE HISTORICAL AMINO ACID CONTENT OF KEY FEED INGREDIENTS THAT ARE USED BY THE LIVESTOCK INDUSTRY

The nutritional quality of grains [*corn*], oilseeds [*soybeans*] and the resulting by-products of each that are used within animal agriculture [*dried distillers grains & solubles; DDGS and Soybean meal; SBM, respectively*] can change from one crop year to the next, and progressively throughout a given crop year. This variation can be attributed to changing cultivars from one crop year to the next, the growing conditions from one crop year to the next, and the post-harvest handling / processing of the crops [*i.e. harvesting and storing wet and dry corn and soybeans, extraction of soybeans for oil and the subsequent heat-processing of soy flakes in the oil extraction process, and the fermentation of corn starch for ethanol production*].

For a nutritionist, it is important to have a good handle on the nutritional matrix [*i.e. year-to-year variance in AA of corn, SBM and DDGS*] of these ingredients so that he or she may efficiently and economically formulate diets that meet the nutritional requirements of today's high-producing livestock [*in this case, poultry and swine*]. The following reports are designed to fulfill this function on a semi-annual basis.

The tables, supplemental graphs and summary at the end of each ingredient report highlight the changes in dry matter [*DM*], crude protein [*CP*] and EAAs [*i.e. Lysine, Threonine, Methionine, Total Sulfur AA, Arginine, Isoleucine, Leucine, Valine and Tryptophan*] for each of the three key ingredients. The statistics that are provided for each of the ingredients include the mean, standard deviation [*stdev*] and number of observations [*count*] for crop years 2007/2008, 2008/2009, 2009/2010 and 2010/2011. A "rolling average" for each ingredient across the four years [*2007/2010*] is highlighted in an "olive color".

If you have any questions or comments about the data that are presented in this packet, please contact your Ajinomoto Heartland sales agent or Ajinomoto Heartland directly at the phone number above.

SUMMARY TABLE: CORN [MAIZE]

SAMPLE	CROP YEAR ‡	STATISTIC	DM	CP	CP (100% DM)	----- as-is basis -----								
						LYS	THR	MET	CYS	M+C	ARG	ILE	VAL	TRP
CORN	2007/ 2008	MEAN	88.32	8.12	9.20	0.26	0.29	0.17	0.17	0.34	0.40	0.27	0.37	0.06
		<i>STDEV</i>	1.13	0.48	0.52	0.02	0.02	0.02	0.01	0.03	0.03	0.02	0.03	0.01
		<i>Observations</i>	87	87	87	87	87	87	87	87	87	87	87	87
	2008/ 2009	MEAN	88.65	7.50	8.46	0.24	0.26	0.16	0.15	0.31	0.37	0.24	0.34	0.06
		<i>STDEV</i>	1.62	0.93	1.02	0.04	0.03	0.03	0.02	0.04	0.05	0.03	0.04	0.01
		<i>Observations</i>	82	82	82	82	82	82	82	82	82	82	82	82
	2009/ 2010	MEAN	88.35	7.17	8.11	0.22	0.26	0.17	0.15	0.32	0.36	0.24	0.33	0.06
		<i>STDEV</i>	1.68	0.67	0.70	0.02	0.02	0.03	0.02	0.04	0.04	0.02	0.03	0.01
		<i>Observations</i>	205	205	205	205	205	205	205	205	205	205	205	205
	2010/ 2011	MEAN	88.50	7.47	8.43	0.24	0.28	0.20	0.17	0.37	0.39	0.26	0.37	0.06
		<i>STDEV</i>	1.41	0.89	0.93	0.02	0.03	0.03	0.02	0.05	0.06	0.03	0.04	0.01
		<i>Observations</i>	173	169	169	151	151	151	151	151	151	151	151	151

‡ A crop year is defined as samples received October 1 of one year to September 30 of the following year [Ex. October 1, 2008 to September 30, 2009].

Corn [*maize*] – Basically an energy source, contributes minimal protein and AA content to the diet.

Dry Matter: Increased to 88.50% [*15 points*].

Crude Protein: Increased on an as-is basis [*7.47%; 30 points*] and dry matter basis [*8.43%; 32 points*]. This positively affected the amino acid content of this season's corn crop.

Lysine: Increased to 0.24% [*2 points*].

Threonine: Increased to 0.28% [*2 points*].

Methionine: Increased to 0.20% [*3 points*].

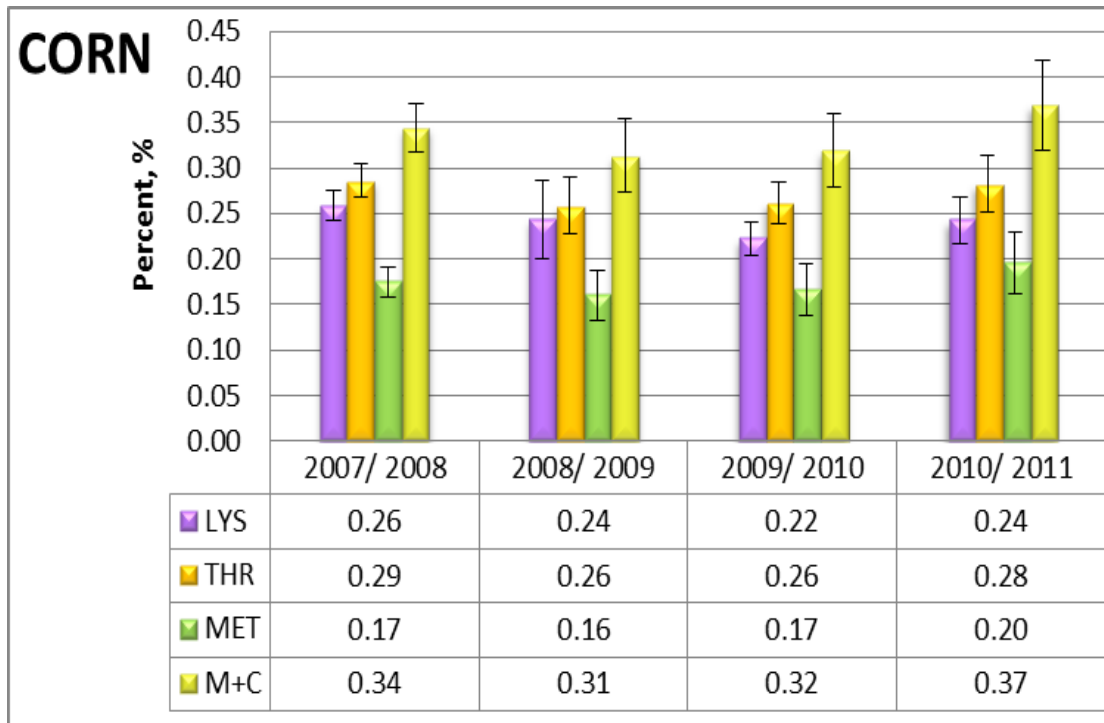
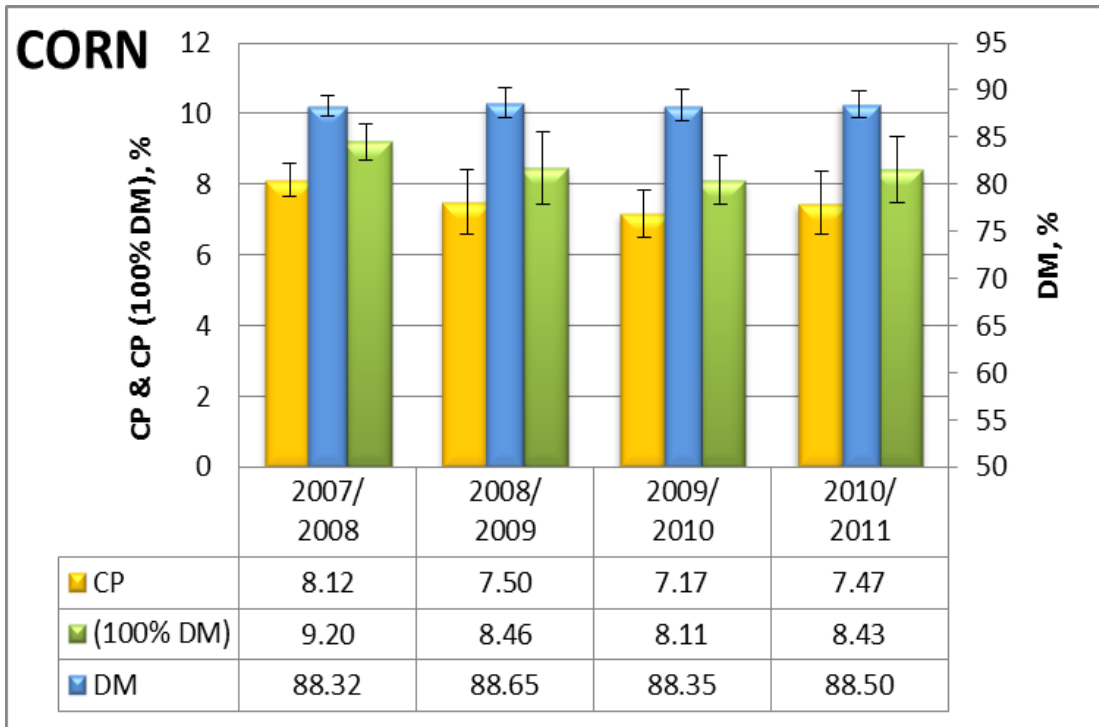
TSAA: Increased to 0.37% [*5 points*].

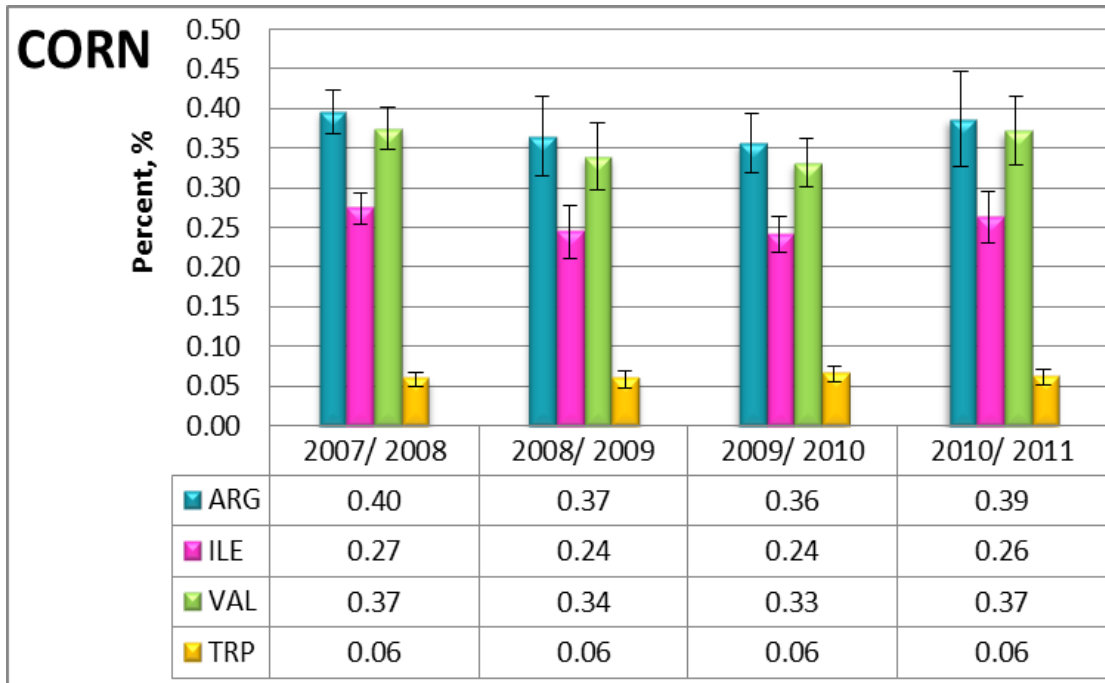
Arginine: Increased to 0.39% [*3 points*].

Isoleucine: Increased to 0.26% [*2 points*].

Valine: Increased to 0.37% [*4 points*].

Tryptophan: The level has been flat at 0.06%, making corn a poor TRP source.





SUMMARY TABLE: CORN DRIED DISTILLER’S GRAINS, WITH SOLUBLES [DDGS]

SAMPLE	CROP YEAR ‡	STATISTIC	DM	CP	CP (100% DM)	----- as-is basis -----								
						LYS	THR	MET	CYS	M+C	ARG	ILE	VAL	TRP
DDGS	2007/ 2008	MEAN	89.60	27.11	30.25	0.87	1.02	0.56	0.49	1.05	1.28	1.00	1.32	0.21
		STDEV	1.53	3.38	3.63	0.15	0.14	0.11	0.08	0.18	0.17	0.16	0.20	0.02
		Observations	227	227	227	227	227	227	227	227	227	227	227	227
	2008/ 2009	MEAN	89.19	26.64	29.87	0.88	0.99	0.54	0.48	1.02	1.22	0.96	1.27	0.21
		STDEV	1.36	2.11	2.29	0.09	0.09	0.06	0.05	0.11	0.10	0.11	0.13	0.01
		Observations	203	203	203	203	203	203	203	203	203	203	203	203
	2009/ 2010	MEAN	88.08	25.68	29.14	0.79	0.98	0.49	0.47	0.97	1.16	0.95	1.25	0.23
		STDEV	1.50	2.41	2.53	0.09	0.11	0.06	0.05	0.09	0.15	0.12	0.13	0.02
		Observations	142	142	142	142	142	142	142	142	142	142	142	142
2010/ 2011	MEAN	87.81	25.62	29.22	0.84	0.99	0.50	0.50	1.01	1.18	0.97	1.34	0.23	
	STDEV	1.90	1.43	1.56	0.07	0.07	0.04	0.04	0.08	0.12	0.08	0.12	0.02	
	Observations	93	89	89	88	88	88	88	88	88	88	88	88	91

‡ A crop year is defined as samples received October 1 of one year to September 30 of the following year [Ex. October 1, 2008 to September 30, 2009].

CORN DRIED DISTILLER'S GRAINS, WITH SOLUBLES [DDGS] – A high-protein by-product of the ethanol industry, can replace SBM and other high-protein by-products.

Dry Matter: Decreased to 87.81% [27 points].

Crude Protein: Decreased on an as-is basis to 25.62% [6 points] and a dry matter basis to 29.22% [8 points].

Lysine: Increased to 0.84% [5 points].

Threonine: Increased to 0.99% [1 point].

Methionine: Increased to 0.50% [1 point].

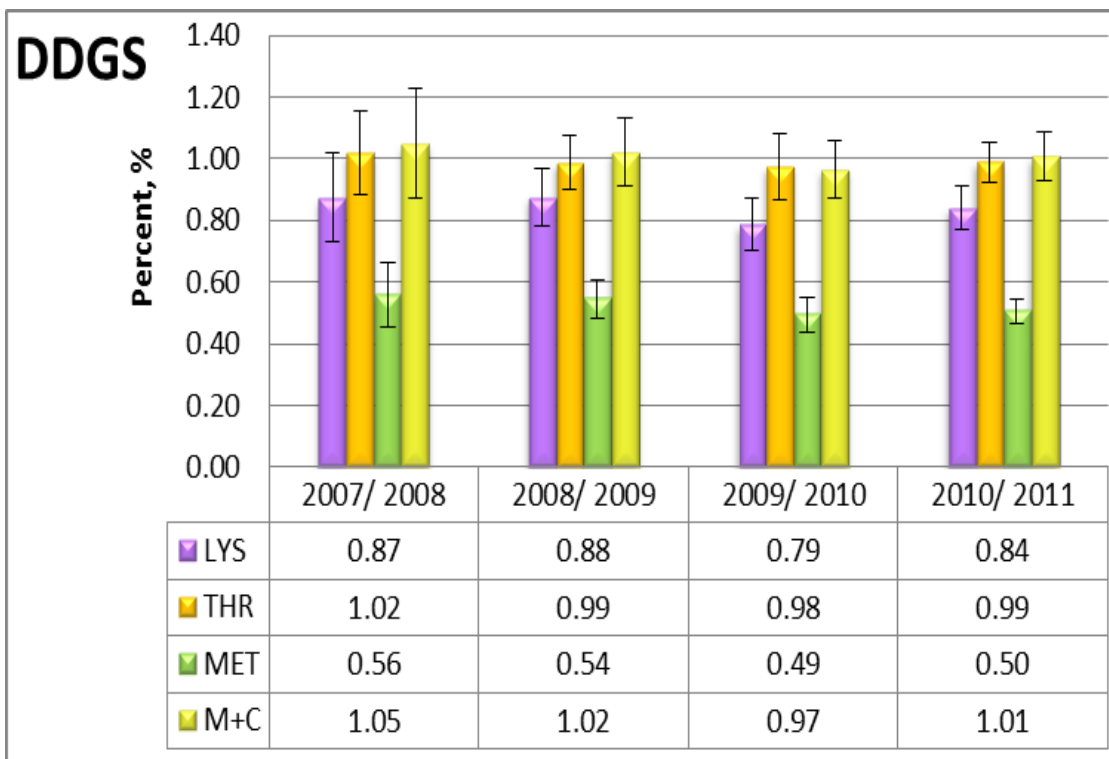
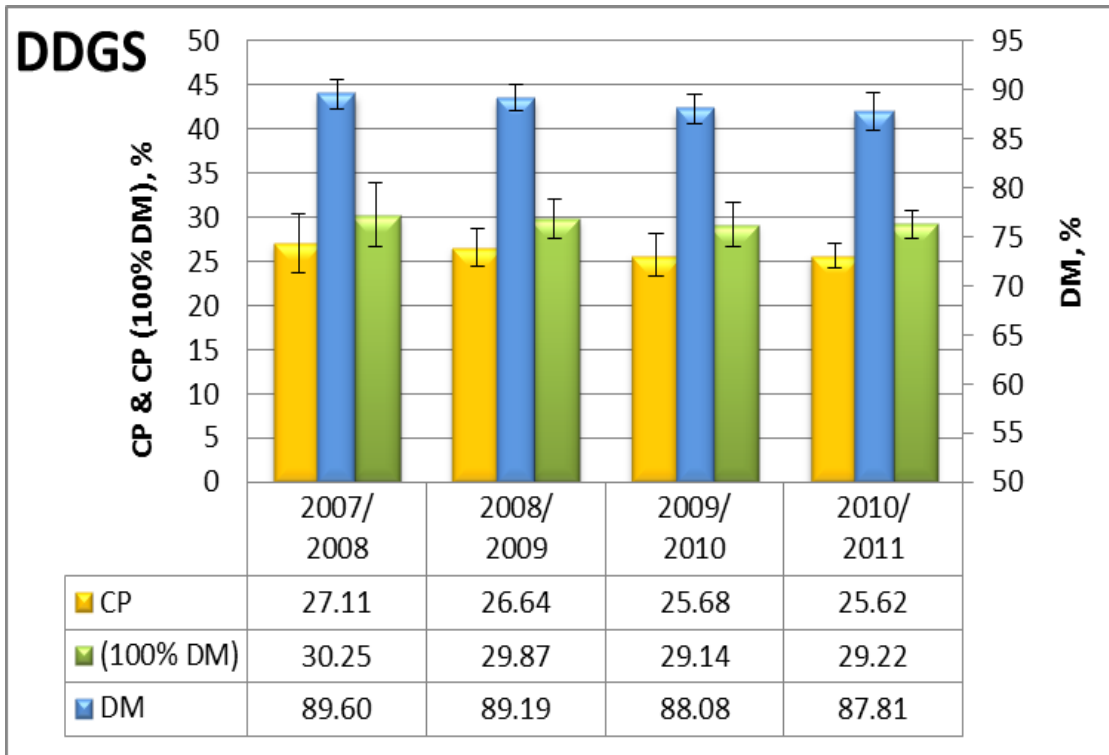
TSAA: Increased to 1.01% [4 points].

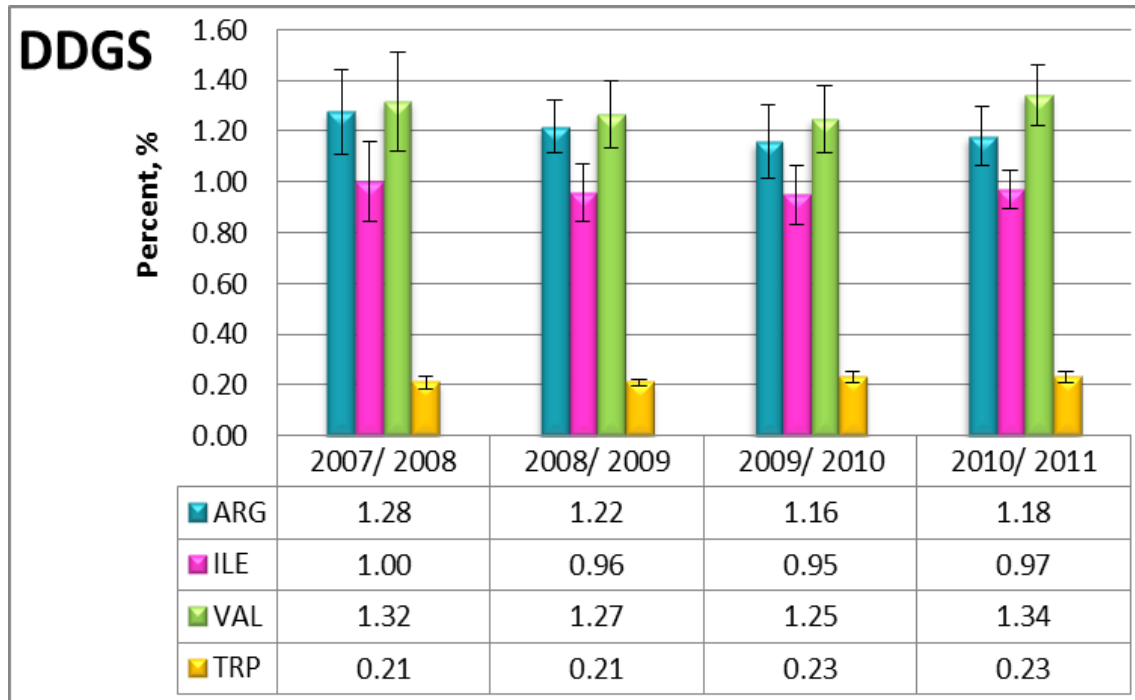
Arginine: Increased to 1.18% [2 points].

Isoleucine: Increased to 0.97% [2 points].

Valine: Increased to 1.34% [9 points].

Tryptophan: The level remained flat at 0.23%, making corn DDGS a poor TRP source.





SUMMARY TABLE: SOYBEAN MEAL [SBM]

SAMPLE	CROP YEAR ‡	STATISTIC	DM	CP	CP (100% DM)	----- as-is basis -----								
						LYS	THR	MET	CYS	M+C	ARG	ILE	VAL	TRP
SBM	2007/ 2008	MEAN	89.78	47.98	53.45	3.01	1.87	0.68	0.66	1.34	3.50	2.20	2.24	0.62
		<i>STDEV</i>	1.07	1.75	2.00	0.14	0.09	0.05	0.04	0.07	0.17	0.12	0.12	0.03
		<i>Observations</i>	234	234	234	234	234	234	234	234	234	234	234	234
	2008/ 2009	MEAN	90.08	47.16	52.35	2.92	1.82	0.69	0.62	1.31	3.36	2.08	2.17	0.61
		<i>STDEV</i>	0.78	1.23	1.46	0.13	0.08	0.04	0.04	0.07	0.19	0.10	0.10	0.03
		<i>Observations</i>	237	237	237	237	237	237	237	237	237	237	237	237
	2009/ 2010	MEAN	89.92	47.05	52.33	2.88	1.84	0.64	0.63	1.27	3.42	2.09	2.16	0.64
		<i>STDEV</i>	1.14	1.10	1.31	0.09	0.06	0.05	0.04	0.06	0.25	0.07	0.10	0.04
		<i>Observations</i>	231	231	231	231	231	231	231	231	231	231	231	231
2010/ 2011	MEAN	89.55	47.67	53.25	2.95	1.88	0.66	0.67	1.33	3.49	2.18	2.30	0.64	
	<i>STDEV</i>	0.60	1.28	1.40	0.08	0.05	0.03	0.04	0.07	0.24	0.07	0.12	0.05	
	<i>Observations</i>	179	167	167	167	167	167	167	167	167	167	167	172	

‡ A crop year is defined as samples received October 1 of one year to September 30 of the following year [Ex. October 1, 2008 to September 30, 2009].

Soybean Meal [SBM] – A high-protein meal that is derived from the solvent extraction of oil from the dehulled soybean; often provides the majority of protein and amino acids in poultry and swine feeds.

Dry Matter: Decreased to 89.55% [37 points].

Crude Protein: Increased on an as-is basis to 47.67% [62 points] and a dry matter basis to 53.25% [92 points].

Lysine: Increased to 2.95% [7 points].

Threonine: Increased to 1.88% [4 points].

Methionine: Increased to 0.66% [2 points].

TSAA: Increased to 1.33% [6 points].

Arginine: Increased to 3.49 [7 points].

Isoleucine: Increased to 2.18% [9 points].

Valine: Increased to 2.30% [14 points].

Tryptophan: Level has remained flat at 0.64%.

