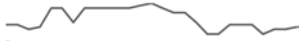
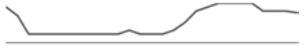
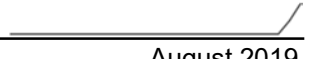
FEED $ENSE

Midwest Edition

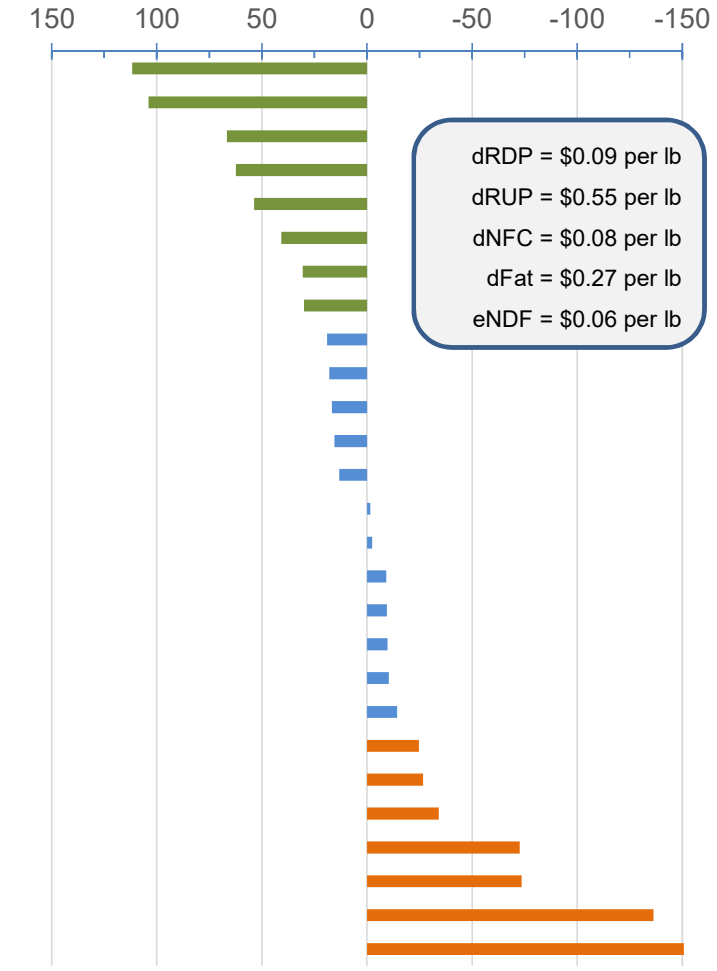
1-Yr Ingredient Price Change ($/T)

	Aug-18	Aug-19	1-Yr Graph
Bakery Byproduct	183	195	
Beet Pulp	205	210	
Corn Grain	151	177	
Cottonseed	245	283	
Hominy	113	135	
Molasses	240	245	
Soyhulls	145	140	
Wheat Grain	203	167	
Wheat Midds	133	155	
Tallow	515	635	
Blood Meal	800	765	
Brewers Grains, 30% DM	75	75	
Canola	275	243	
Corn Gluten Feed	158	138	
Corn Gluten Meal	515	445	
Cottonseed Meal	290	270	
Distillers Grains	165	160	
Linseed Meal	325	275	
Meat and Bone	330	320	
Soybean Meal	333	294	
Bypass SBM	343	304	
Urea	410	510	
Alfalfa - Supreme	245	230	
Alfalfa - Premium	205	200	
Alfalfa - Good	175	190	
Corn Silage, 35% DM	50	50	
Straw	140	175	

FEED $ENSE
Midwest Edition

Global Nutrient Analysis

	Market Price ($/T)	Predicted Value ($/T)	Difference ($/T)
Distillers Grains	160	272	112
Corn Gluten Meal	445	549	104
Bypass SBM	314	381	67
Corn Gluten Feed	138	200	62
Hominy	135	189	54
Corn Silage, 35% DM	50	66	41
Canola	243	273	30
Soybean Meal	294	324	30
Wheat Grain	167	185	19
Bakery Byproduct	195	213	18
Corn Grain	177	194	17
Brewers Grains, 30% DM	75	80	15
Wheat Midds	155	168	13
Urea	510	508	-2
Straw	170	167	-3
Tallow	635	626	-9
Soyhulls	140	131	-9
Alfalfa - Premium	200	190	-10
Alfalfa - Good	190	180	-10
Meat and Bone	320	306	-14
Cottonseed Meal	270	245	-25
Alfalfa - Supreme	230	203	-27
Cottonseed	283	249	-34
Beet Pulp	210	137	-73
Linseed Meal	275	201	-74
Molasses	245	131	-136
Blood Meal	765	611	-154



FEED $ENSE
Midwest Edition

Component Nutrient Analyses

Carbohydrate Analysis	Market Price ($/T)	Predicted Value ($/T)	Difference ($/T)
Corn Silage, 35% DM	50	68	47
Beet Pulp	210	240	30
Hominy	135	156	21
Molasses	245	254	11
Corn Grain	177	177	0
Alfalfa - Good	190	190	0
Alfalfa - Premium	200	190	-10
Wheat Grain	167	155	-12
Bakery Byproduct	195	178	-17
Soyhulls	140	122	-18
Alfalfa - Supreme	230	187	-43
Wheat Midds	155	111	-44

per lb
Starch = $0.10
Sugar = $0.16
Sol Fiber = $0.28
eNDF = $0.10

Protein Analysis	Market Price ($/T)	Predicted Value ($/T)	Difference ($/T)
Corn Gluten Meal	445	565	120
Distillers Grains	160	215	55
Bypass SBM	314	360	46
Meat and Bone	320	336	16
Urea	510	515	5
Canola	243	243	0
Soybean Meal	294	291	-3
Brewers Grains, 30% DM	75	70	-15
Corn Gluten Feed	138	121	-17
Cottonseed Meal	270	231	-39
Linseed Meal	275	169	-106
Blood Meal	765	657	-108

per lb
dRDP = $0.09
dRUP = $0.63

Fiber Analysis	Market Price ($/T)	Predicted Value ($/T)	Difference ($/T)
Soyhulls	140	259	119
Corn Silage, 35% DM	50	75	64
Straw	170	225	55
Corn Gluten Feed	138	125	-13
Alfalfa - Good	190	147	-43
Beet Pulp	210	153	-57
Distillers Grains	160	99	-61
Brewers Grains, 30% DM	75	35	-119
Cottonseed	283	130	-153

per lb
eNDF = $0.07
dNDF = $0.24

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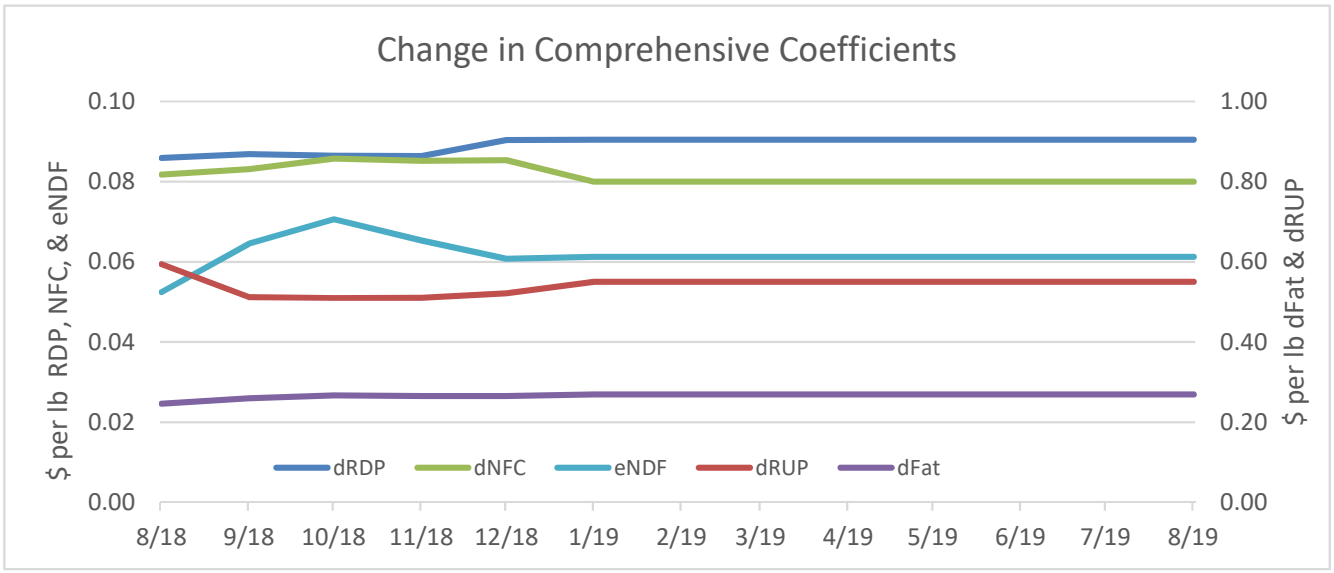
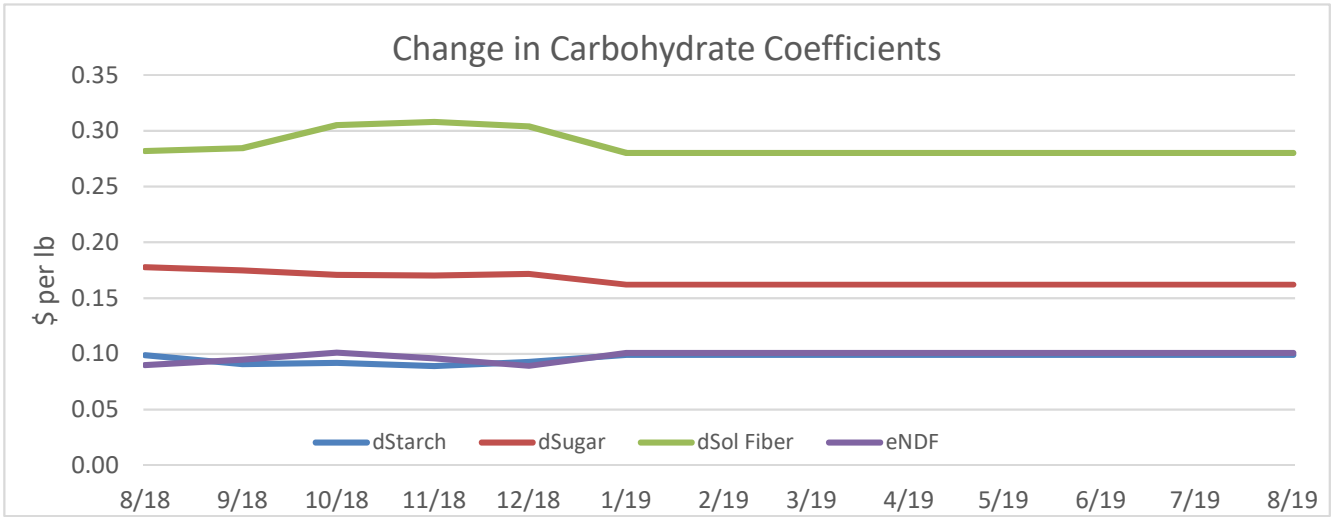
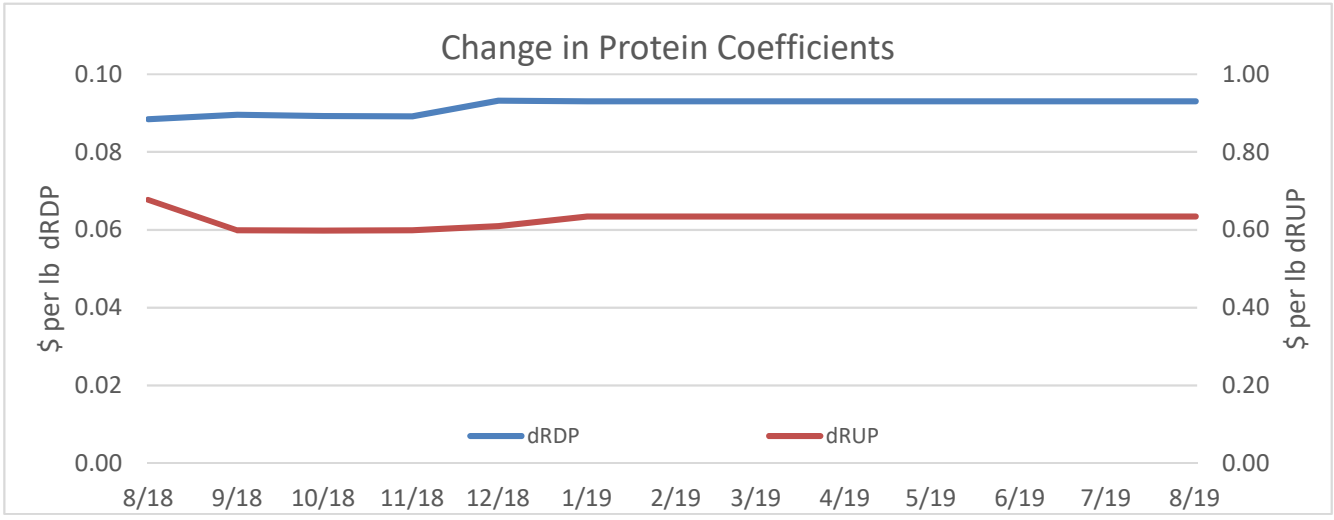






FEED $ENSE
Midwest Edition

Non-Forage Purchased Feed Costs

A ration supporting 90 lbs milk at 3.9% fat and 3.2% protein was modeled in CNCPS at 56 lbs DMI. The ration was composed of 60% forage using 45% corn silage and 15% mostly legume forage. Composition of the forages were based on samples (+30,000) submitted to a commercial lab during 2018.

To complement the forages, grains, byproducts, minerals, vitamins, etc made up the remaining 40% of DM. The major ingredients of the starch and protein mix were ground corn (39.5%), canola meal (21.0%), bypass SBM (20.7%), soyhulls (14.8%), blood meal (3.6%), Mepron® (2.2%) and urea (2.2%). The remaining 3.5% of DM was composed of bypass fat, minerals, vitamins, and additives.

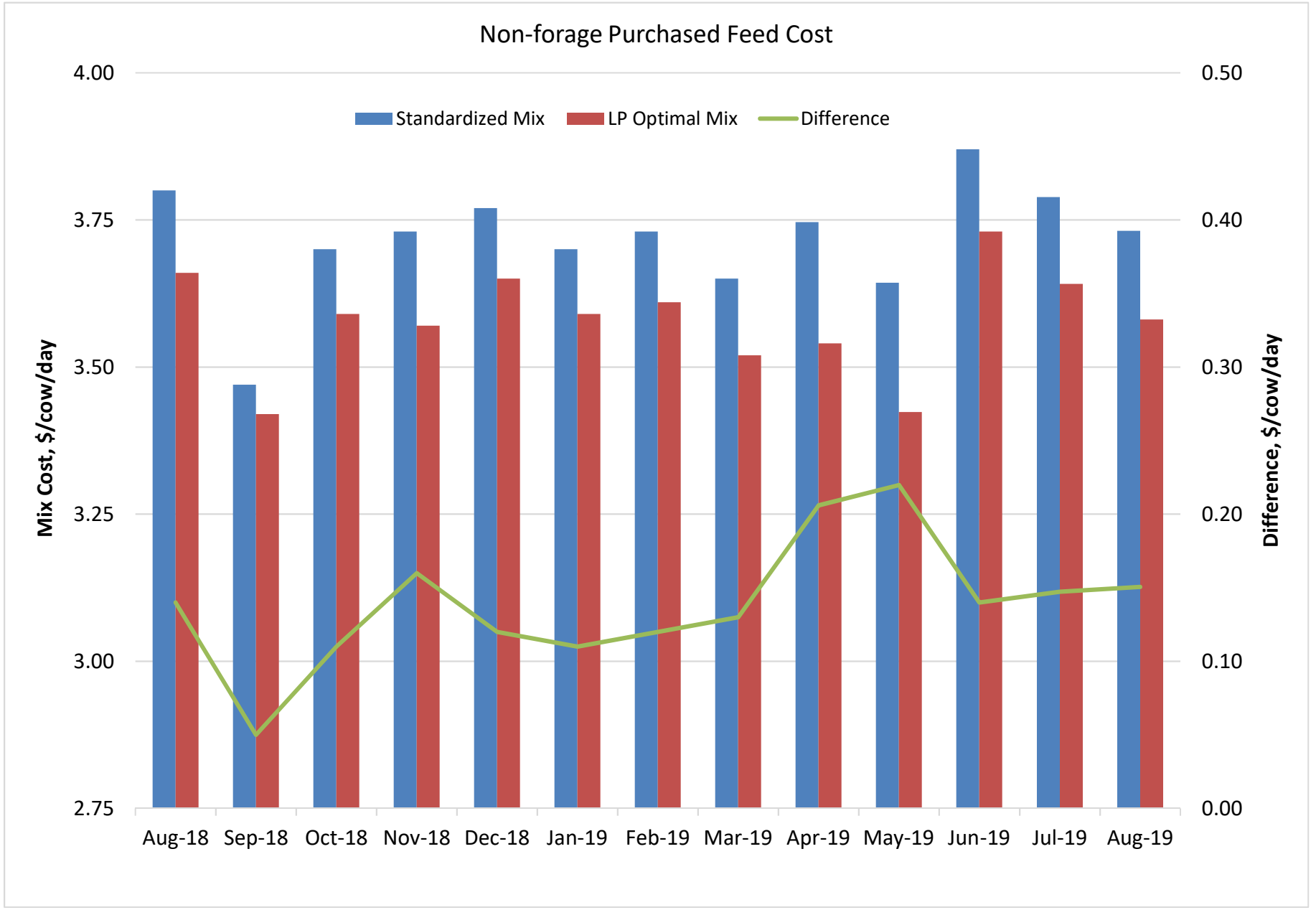
The nutrient composition (% DM) of the starch and protein mix, which will be referred to as the Standardized Mix, is 11.6% RDP, 13.5% digestible RUP, 28.4% starch, 5.5% sugar, 4.8% fat, 0.36% mMet, 0.81% mLys, and 0.3% mHis. Simple linear programming was used to find the optimal or minimal cost subject to the nutrient composition of the Standardized Mix using all the non-forage feed ingredients in Feed $ense. The optimal mix will be referred to as the LP Optimal Mix.

Page 6 of Feed $ense shows the changes in the Standardized Mix cost over the last 13 months. Except for a dip last September, purchased feed costs have averaged approximately $3.75/cow/day. For the most recent month, the Standardized Mix is $3.73/cow/day which is a decrease of 5¢/cow/day from the previous month. Since Sep, the 26¢/cow/day increase has been driven by the increase in corn, blood meal, and urea. On average, the LP Optimal Mix was 14¢/cow/day less than the Standardized Mix with much of the difference occurring this spring. In some months, such as Sep, there was little difference between the Standardized and LP Optimal Mixes.

The feeds that were pulled in that reduced cost were typically feeds the are undervalued in Feed $ense. This is an illustration of the usefulness of the simple ranking in Feed $ense. A 14¢/cow/day savings is very optimistic but savings of 5-6¢/cow/day may be achievable if undervalued feedstuffs fit in the ration. Use of undervalued feedstuffs may reduce ration cost, but value is only one of several factors that should be considered when evaluating the inclusion of a new ingredient. The most important rule is never sacrifice IOFC when attempting to reduce feed cost.

FEED $ENSE

Midwest Edition



FEED $ENSE
Midwest Edition

Historical Undervalue/Overvalue of Feedstuffs ($/T)

Global Analysis	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19
Alfalfa - Good	-12	-20	-20	-24	-20	-20	-29	-33	-31	-30	-23	0	-10
Alfalfa - Premium	-26	-32	-42	-36	-26	-20	-26	-30	-26	-23	-25	-14	-10
Alfalfa - Supreme	-52	-52	-52	-50	-35	-33	-35	-45	-54	-38	-31	-39	-27
Bakery Byproduct	39	42	43	43	44	30	37	32	39	21	31	19	18
Beet Pulp	-73	-82	-84	-90	-89	-72	-75	-52	-53	-61	-54	-53	-73
Blood Meal	-150	-59	-61	-61	-48	-69	-58	-88	-165	-238	-181	-149	-154
Brewers Grains, 30% DM	43	20	22	21	25	34	24	22	36	26	22	20	15
Bypass SBM	58	49	38	37	26	57	43	53	68	88	46	61	67
Canola	6	29	7	-18	-16	3	4	1	-4	32	17	21	30
Corn Gluten Feed	38	30	29	30	28	33	37	32	43	56	59	50	62
Corn Gluten Meal	68	-10	-8	-7	-21	-8	-33	-14	40	133	129	107	104
Corn Grain	45	52	42	47	51	51	49	43	37	31	21	18	17
Corn Silage, 35% DM	21	28	35	31	28	26	36	30	23	25	31	35	41
Cottonseed	18	15	21	37	26	20	10	27	30	-20	-27	-76	-34
Cottonseed Meal	-19	-71	-41	-26	-21	-47	-27	-25	-19	-16	-20	-21	-25
Distillers Grains	116	111	110	107	98	96	106	100	118	136	132	123	112
Hominy	85	81	87	89	85	77	85	76	75	61	53	54	54
Linseed Meal	-71	-58	-25	-21	8	-18	-7	7	-35	-73	-72	-71	-74
Meat & Bone Meal	46	34	44	44	51	41	66	72	106	59	30	-7	-14
Molasses	-132	-129	-125	-126	-125	-107	-123	-132	-138	-147	-134	-137	-136
Soybean Meal	-1	2	-9	-10	-21	4	-2	9	16	39	1	22	30
Soyhulls	-18	-10	-52	-55	-54	-53	-61	-44	-24	2	-17	-6	-9
Straw	5	17	25	18	14	14	23	19	11	18	19	24	-3
Tallow	-28	-21	-27	-30	-29	-22	-26	-30	-35	-12	-11	-5	-9
Urea	0	5	3	3	2	2	1	-2	-4	-6	0	0	-2
Wheat Grain	-20	-5	1	3	6	1	7	20	18	23	16	9	19
Wheat Midds	51	44	47	51	22	-18	-10	-14	-12	-33	12	14	13

Carbohydrate Analysis	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19
Alfalfa - Good	15	9	15	12	11	10	4	4	5	-3	0	11	0
Alfalfa - Premium	-15	-17	-21	-13	-8	-7	-8	-12	-10	-12	-18	-16	-10
Alfalfa - Supreme	-58	-51	-45	-42	-32	-36	-32	-43	-55	-47	-43	-58	-43
Bakery Byproduct	-11	-10	-13	-14	-12	-26	-16	-16	-10	-11	-6	-15	-17
Beet Pulp	32	28	38	34	31	34	37	40	39	31	36	35	30
Corn Grain	19	19	9	10	18	29	19	12	9	9	0	3	0
Corn Silage, 35% DM	46	44	53	47	44	53	57	62	60	54	56	50	47
Hominy	37	28	33	33	31	31	34	25	26	24	17	23	21
Molasses	8	8	8	8	8	16	12	13	11	12	8	11	11
Soyhulls	-24	-12	-49	-51	-54	-56	-61	-46	-28	-4	-24	-18	-18
Wheat Grain	-55	-46	-41	-42	-36	-29	-32	-18	-17	-12	-17	-19	-12
Wheat Midds	-26	-31	-29	-25	-54	-93	-84	-89	-89	-91	-46	-44	-44

Protein Analysis	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19
Blood Meal	-78	16	15	16	28	4	18	-14	-92	-199	-137	-106	-108
Brewers Grains, 30% DM	4	-21	-21	-21	-17	-9	-20	-22	-7	-2	-6	-11	-15
Bypass SBM	38	27	15	15	4	34	19	30	46	69	26	39	46
Canola	-25	-2	-26	-50	-48	-29	-30	-23	-27	4	-12	-10	0
Corn Gluten Feed	-30	-43	-48	-45	-45	-38	-42	-42	-27	-14	-16	-27	-17
Corn Gluten Meal	102	27	29	31	16	27	2	22	76	146	144	121	120
Cottonseed Meal	-46	-100	-71	-55	-50	-77	-58	-56	-50	-30	-33	-35	-39
Distillers Grains	68	61	58	56	47	45	52	47	67	84	78	65	55
Linseed Meal	-150	-141	-111	-106	-77	-102	-94	-79	-119	-101	-103	-104	-106
Meat & Bone Meal	33	20	29	30	36	24	51	54	86	85	59	22	16
Soybean Meal	-27	-25	-38	-38	-49	-23	-33	-19	-10	9	-32	-12	-3
Urea	12	18	16	16	15	14	14	10	7	-2	6	6	5

Fiber Analysis	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19
Alfalfa - Good	-46	-54	-58	-62	-56	-54	-65	-67	-63	-64	-59	-34	-43
Beet Pulp	-45	-56	-44	-47	-45	-29	-37	-19	-27	-47	-40	-41	-57
Brewers Grains, 30% DM	-114	-118	-106	-105	-104	-106	-105	-113	-119	-125	-121	-122	-119
Corn Gluten Feed	-35	-37	-33	-30	-32	-30	-26	-33	-29	-23	-20	-29	-13
Corn Silage, 35% DM	48	48	55	52	53	54	58	53	49	50	52	57	64
Cottonseed	-131	-129	-128	-111	-121	-133	-135	-122	-126	-144	-149	-198	-153
Distillers Grains	-60	-46	-38	-39	-50	-63	-43	-55	-55	-50	-47	-56	-61
Soyhulls	120	122	103	104	107	103	97	98	105	117	107	117	119
Straw	59	63	63	57	58	62	68	66	66	73	72	81	55

Feed $ense Margins

Midwest Edition