

**BEFORE THE PENNSYLVANIA MILK MARKETING BOARD**

**OVER - ORDER PREMIUM HEARING**

**ALL MILK MARKETING AREAS**

August 30, 2017

Testimony of John D. Rutherford, Jr.

Presented on behalf of the Pennsylvania Association of Dairy Cooperatives:

Dairy Farmers of America, Inc., Dairy Marketing Services, LLC,

Lanco Dairy Farms Co-op, Inc., Land O'Lakes, Inc., and

Maryland & Virginia Milk Producers' Cooperative Association, Inc.

Good morning, my name is John Rutherford. I am Director of Economics at Dairy Farmers of America- Northeast Council. Thank you for the opportunity to provide testimony this morning. My testimony is on behalf of the Pennsylvania Association of Dairy Cooperatives (PADC) whose members are: Dairy Farmers of America, Inc.; Dairy Marketing Services, LLC; Lanco Dairy Farms Co-op, Inc.; Maryland & Virginia Milk Producers' Cooperative Association, Inc.; and Land O'Lakes, Inc., ("the Cooperatives"). Together these cooperatives represent more than one-half of the Commonwealth's dairy farmers.

This hearing was noticed in Pennsylvania Milk Marketing Board Bulletin No. 1533 regarding the setting of the over order premium (OOP) for Class I milk- both the amount of the premium and the period of time that it will apply. I will review the current and most recent situation, covering feed and milk prices and the resulting margins experienced on Pennsylvania dairy farms. Then I will discuss my outlook for the near future to explain our position for the OOP and its duration.

#### 2016 Drought

The drought conditions over much of the 2016 growing season caused severe damage in some locations of the state. However, the overall damage to Pennsylvania agriculture was mixed. Please see PADC Exhibit 7 which includes data from the USDA-NASS Crop Production 2016 Summary report. Hardest hit was corn. This is important because corn silage, along with alfalfa hay, are the two principal sources of forage to dairy farms in Pennsylvania. Corn grain yield per acre was down 14.0% and total production of corn grain was down 12.8%. Corn silage average yield per acre was down 12.5%, but due to harvesting an additional 50,000 acres, total silage production was down only 1.3% from the prior year. Total harvested tonnage of alfalfa

and alfalfa mixtures was down 7.3%. Not all feed suffered. The average soybean yield per acre and total production was unchanged from 2016. The total tonnage of “All-other forage” production was up almost 17%.

### Milk Production

According to USDA milk production statistics, June 2017 total Pennsylvania milk production was the same as June 2016 (see PADC Exhibit 8). This 0% change breaks a string of nine consecutive months of increasing production going back to September 2016. Year-to-date total milk production in Pennsylvania is up 2.06% compared to an increase of only 0.15% through June last year.

The recent growth in milk production has come from more milk per cow, which is up 3.02% year to date. June milk per cow increased only 0.88%, however, which was down significantly after four months of 3.05% or greater growth.

The total number of dairy cows in Pennsylvania declined 5,000 last year, to 525,000 from July to November. Given this timing, it is likely that the poor supply situation for dairy forages played a role in reducing the total Pennsylvania dairy herd last year.

### Milk Price

The price of milk in Pennsylvania was also something of a mixed result. Please see PADC Exhibit 9 which includes milk price data from USDA-AMS and USDA-NASS. The all-milk price averaged \$17.15/cwt. in 2016. The price improved in the second half of the year versus the first half, but was lower in 2016 than in 2015 for every month until December. The average of the all-milk price over the second half was \$1.44 (8.7%) higher than in the first half of the year. In the most recent six months for which data is available (December 2016 through May 2017)

the Pennsylvania all-milk price average was \$18.85/cwt. This is \$1.87, (11.0%) higher than the \$16.98/cwt. over the same period a year earlier.

### Margins

Higher milk prices will always mean a larger margin over feed cost as long as the price of feed is relatively stable or falls. The latter has been the case for the most recent six-months for which we have available data (December 2016 to May 2017). See the Feed Cost/cwt. data from Dr. Jim Dunn on PADC Exhibit 9. The Pennsylvania all-milk price averaged \$18.85/cwt., an increase of \$1.87 over the same period a year earlier. At the same time, the cost of feed per cwt. of milk produced fell 49 cents. The combination of these two movements was an expansion of the income over feed cost.

### Recap

So, to recap the recent situation, margins have improved. The drought did create some lower yields in 2016, especially for corn. However, feed prices per cwt. of milk produced have been lower than they were a year earlier and milk prices have been stronger.

### Outlook

Prices of corn, soybeans, and soybean meal in the futures market provide much of the base for setting local prices for feed. Futures grain prices in the US are driven primarily by the Chicago Mercantile Exchange (CME). Futures are simply a standardized contract for delivery of a product at some future date. This gives the owner of the contract the assurance that the product will have a set/known value when it is delivered at that future date.

Local prices will vary higher or lower than the CME futures price depending on the relative scarcity of the product locally. The difference between the CME futures and the local price is

called “basis”. See the feed price data from USDA-NASS and CME prices shown in PADC Exhibit 10. In the marketing years ending in August of 2015 and 2016, the corn price in Pennsylvania averaged 19.4 and 38.5 cents, respectively, higher than the CME closing futures price. Remember that these are averages so there can be individual months higher or lower. Generally, there will be a positive 20-30 cent basis for the year in Pennsylvania relative to the CME. (Positive basis means we add the basis to the CME price to get our local price.) In the nine months since September 2016 (the new marketing year), the basis has averaged 48.2 cents compared to 23.1 cents a year earlier. This is due to the drought related corn yield reduction which made the local price farther above the CME futures price. The movement of the difference between the futures and local price is the basis risk. It is one risk that continues, even if one ‘sets’ his price using futures.

Looking at closing CME futures on July 24, 2017, in PADC Exhibit 10, we see that corn prices are expected to average higher by 35-40 cents in the coming September – December and September – March periods than the prior year. Therefore, our first thought for the corn price is that it will be higher by about 10%. However, we must also look at basis. If the local basis returns to its normal level, then the Pennsylvania corn price would still be about 10-15 cents higher than last year. If that basis takes a few months to decline, then the average Pennsylvania price will be even farther above last year.

Soybean futures are indicating very little change compared to the prior year. In both periods September-December and September-March, the price is less than 2% above a year ago. As stated earlier, soybeans in Pennsylvania are not reported on by USDA so I use the neighboring state of Ohio as a proxy. Unlike the Pennsylvania corn price basis, the soybean basis for Ohio

has been contracting. In fact, the average basis from calendar year 2015 compared to the calendar year 2016 fell almost 50 cents from a positive 28 cents to minus 20.5 cents. But given some slower development of the soybean crop in Ohio this year, it is unlikely the basis gets any smaller and may increase somewhat through the coming marketing year. For these reasons, the outlook for soybean prices is no change to slightly higher versus a year ago.

The last major component of the feed price is alfalfa hay. Since March 2016, the price of alfalfa hay in Pennsylvania has varied between \$163 and \$200/ton. From January 2014 to February 2016, this price was less than \$198 only once. The point is that recent alfalfa hay prices, even with the 2016 drought, have been their lowest in three years and are maintaining this level. I do not see a trend, or any sign in USDA's Crop Progress report, that moves the alfalfa price higher in the coming months.

For the reasons above, futures are pointing to feed prices similar or slightly higher than the same period last year.

#### Milk Prices

The price farmers receive for their milk will depend on the price level for the various classes and their respective utilization rates. CME futures give us an indication of what the Class III and Class IV prices will be in the coming months.

PADC Exhibit 9 includes CME dairy futures from the close on July 24, with comparisons to the same periods (September – December and September – March) as reviewed for the feed prices. The Class III price is expected to be very similar (within 2%) to the prior year, but the Class IV price is predicted to be 10-20% higher.

An estimate of the Pennsylvania all-milk price can be created by adding what amounts to a monthly basis to that month's national milk price. The national price I referenced was actually two prices, the Class III and Class IV CME futures. I used the higher of these two because there are months where Class IV is the mover of the Class I price. Using the 'higher of' price reduced the volatility of my estimate.

The all-milk price represents the average price processors are paying for milk in an area (usually reported by state or nationally). This includes all components and premiums paid, but does not include charges such as hauling deductions. The number is reported at the average fat content for the area for the applicable month(s). This number will be weighted by the Class utilizations in the area. This price is used because it is the one most commonly referred to in calculations of margins, income over feed costs, or just as a general barometer of milk prices by state.

The monthly basis used is the monthly Pennsylvania all-milk price less the higher of the announced Class III or Class IV price for that month. I calculated a 5-yr average (2012 – 2016) for each month of the year and added this to the higher of the Class III and IV futures prices.

The results, shown in PADC Exhibit 9, predict a futures-based Pennsylvania all-milk price slightly higher (4.2% and 6.9%) than for the prior year.

### Margins

Margins for the coming months should be similar to the prior year. Feed prices, based on futures, will be similar-to-higher in the coming months. With basis currently high, the time it will take this to normalize -- any time from before the start of harvest up to later in the marketing year -- will determine just how much more expensive feed will be next year.

The Pennsylvania all-milk price will be only slightly higher next year.

This discussion of margins is devoid of exact numbers because these are not as important as the coming changes. I do not see indications, even potential warning signs, for a major move of either milk price or feed costs. If we look at the equation for the margin over feed cost

$$\text{milk price} - \text{feed cost} = \text{margin over feed cost}$$

we see this point. If both numbers on the left side of the equation are changed in the same direction, by a similar percentage, the resulting margin will likewise be similar to where it was originally. Without a large change coming to either of these numbers, it is not likely there will be major change coming in the margin over feed for Pennsylvania dairy farmers.

#### Summary

Average milk and feed prices in the coming months should remain consistent with where they were one year earlier. Relative stability in feed costs and milk price should be acknowledged in a similar stability in the over-order premium. The Cooperatives request that the Board maintain the OOP at the \$1.60 level for the period of October 1, 2017 through March 31, 2018.

Thank you for your time and attention. I will be happy to answer any questions you may have.



**John D. Rutherford, Jr.**  
*Curriculum Vitae*

**Education**

Michigan State University, East Lansing, MI (1993-1995)  
Master of Science Degree in Agricultural Economics  
Thesis entitled "An Analysis of the Managerial Decision to Purchase All Feedstuffs on Michigan Dairy Farms".  
University of Michigan, Ann Arbor, MI (1984-1989)  
Bachelor of Arts Degree in Economics  
Minor line of study in Accounting

**Employment**

Dairy Farmers of America- Northeast Council, East Syracuse, NY  
December 2015 to present  
Director of Economics, Planning, and Operations  
Alouette Cheese-USA, New Holland, PA  
March 2012- December 2015  
Director- Dairy Procurement  
Lactalis American Group, Buffalo, NY  
2008- 2012  
Corporate Director- Milk Procurement  
International Dairy Foods Association, Washington, DC  
2000-2008  
Assistant Director of Economic Analysis  
Penn State University Extension, Lebanon, Berks, and Dauphin Counties  
1997 – 2000  
Farm Management Agent  
Pennsylvania Dairy-MAP  
1996 - 1997  
West Region Coordinator

**Professional Designations**

Board Member- Dairy Institute of California (2010-2012)  
Board Member- Northeast Dairy Foods Association (2011-2012)  
Member- Northeast Dairy Leadership Team (2009-2011)

**Professional/Community Activities**

Coordinator- Lebanon County Hazardous Waste Collection (2000)  
Manager- Capital Hill Ice Cream Party (2001-2007)

**Publications**

Extension Corner- articles for Lebanon Daily News (1997-2000)  
Dairy Herd Management Software pamphlet for Lebanon County Extension (1999)  
Farm Accounting Software pamphlet for Lebanon County Extension (1999)  
Dairy Herd Management Software article for Hoards Dairyman (1999)  
Quarterly Fluid Market research reports for MilkPEP (2000-2008)  
Quarterly Market Research Reports for Frozen Dairy, Cultured Dairy, and Cheese for member subscribers (2000-2008)

**Testimony**

Class I Differentials in FMMOs 5, 6 and 7 Tampa Bay, FL (May 2007)  
California Legislature Hearing for Assembly Bill 31 Sacramento, CA (May 2013)  
CDFA hearing on whey price adjuster (June 2015)

## Exhibit 7: Pennsylvania Crop Acreage and Yields, Selected Crops, 2014-2016

	2014	2015	2016		2014	2015	2016
<b><u>Total Crop Acreage</u></b>				<b>Hay Crops</b>			
Planted	3789	3568	3668	<b>All hay</b>			
Harvested	3679	3488	3561	Harvest	1400	1290	1350
Pct harvested	97.1%	97.8%	97.1%	Yield (ton/Ac)	2.28	2.33	1.29
				Total Production (ton)	3185	3010	3150
<b><u>Grain Crops</u></b>							
<b>Corn</b>				<b>Alfalfa and mixtures</b>			
Total planted	1460	1340	1400	Harvest	350	430	350
Harvested Grain	1030	940	950	Yield (ton/Ac)	2.8	2.6	3
Grain yield (bu/Ac)	154	147	129	Total Production (ton)	980	1118	1050
Total Production (bu)	158,620	138,180	122,550	Chg production vrs PY			-6.1%
Harvested Silage	410	390	440				
Silage yield (ton/Ac)	20	20	17.5	<b>All other hay</b>			
Total Production (ton)	8200	7800	7700	Harvest	1050	860	1000
Total acres not harvested	20	10	10	Yield (ton/Ac)	1.5	2.3	1.3
Pct harvested as grain	70.5%	70.1%	67.9%	Total Production (ton)	2205	1892	2100
Pct harvested as silage	28.1%	29.1%	31.4%				
Pct harvested	98.6%	99.3%	99.3%	<b>All Forage (1)</b>			
Chg grain yield vrs PY	na	-4.8%	-14.0%	Harvest	1720	1620	1720
Chg Total production grain	na	-14.8%	-12.8%	Yield (ton/Ac)	2.65	2.71	2.68
Chg silage yield vrs PY	na	0.0%	-12.5%	Total Production (ton)	4562	4393	4613
Chg Total production silage	na	-4.9%	-1.3%				
				<b>All Alfafa (2)</b>			
<b>Oats</b>				Harvest	560	660	540
Planted	90	95	85	Yield (ton/Ac)	3.52	3.27	3.71
Harvested	60	65	50	Total Production (ton)	1969	2160	2002
Yield (bu/Ac)	58	55	67	Chg production vrs PY			-7.3%
Total Production (bu)	3480	3575	3350				
				<b>AO Forage (2)</b>			
<b>Barley</b>				Harvest	1160	960	1180
Planted	70	55	55	Yield (ton/Ac)	2.24	2.33	2.21
Harvested	50	40	38	Total Production (ton)	2593	2233	2611
Yield (bu/Ac)	71	65	75	Chg production vrs PY			16.9%
Total Production (bu)	3550	2600	2850				
<b>All wheat (winter)</b>							
Planted	185	195	190				
Harvested	150	175	150				
Yield (bu/Ac)	65	65	68				
Total Production (bu)	9750	11375	10200				
<b>Soybeans</b>							
Planted	570	580	580				
Harvested	565	575	575				
Yield (bu/Ac)	49	44	44				
Total Production (bu)	27685	25300	25300				

Note- All acres and production numbers are in thousands.

Source: USDA-NASS, Crop Production 2016 Summary, released January 2017

(1) All forage are production is the sum of the following dry equivalents: alfalfa hay harvested as dry hay, all other hay harvested as dry hay, alfalfa haylage and greenchop, all other haylage and greenchop; after converting alfalfa and all other haylage and greenchop to a dry equivalent basis.

(2) All alfalfa forage production is the sum of alfalfa harvested as dry hay and alfalfa haylage and greenchop production after converting to a dry equivalent basis.

(3) All other forage production is the sum of other hay harvested as dry hay and other haylage and greenchop production after converting to a dry equivalent basis.

## Exhibit 8: Pennsylvania Milk Production

### Total Production (millions)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	917	840	938	925	962	909	920	904	856	880	856	893
2016	909	864	938	925	957	906	912	886	859	892	861	911
2017	927	858	966	948	977	906						

### Average Daily

2015	29.6	30.0	30.3	30.8	31.0	30.3	29.7	29.2	28.5	28.4	28.5	28.8
2016	29.3	29.8	30.3	30.8	30.9	30.2	29.4	28.6	28.6	28.8	28.7	29.4
2017	29.9	30.6	31.2	31.6	31.5	30.2						

### Pct changes in total production

2016	-0.87%	-0.69%	0.00%	0.00%	-0.52%	-0.33%	-0.87%	-1.99%	0.35%	1.36%	0.58%	2.02%
2017	1.98%	2.85%	2.99%	2.49%	2.09%	0.00%						

### YTD cumulative changes

2016	-0.87%	0.91%	0.59%	0.44%	0.24%	0.15%	0.00%	-0.25%	-0.18%	-0.03%	0.02%	0.19%
2017	1.98%	2.39%	2.60%	2.75%	2.47%	2.06%						

### Pennsylvania Cows (000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	530	530	530	530	530	530	530	530	530	530	530	530
2016	530	530	530	530	530	530	530	529	527	526	525	525
2017	525	525	525	525	525	525						

### Pct changes in number of cows

2016	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.2%	-0.6%	-0.8%	-0.9%	-0.9%
2017	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%	-0.9%						

### Pennsylvania Prod/Cow

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	1730	1585	1770	1745	1815	1715	1736	1706	1615	1660	1615	1685
2016	1715	1630	1770	1745	1805	1710	1735	1695	1630	1696	1640	1735
2017	1766	1634	1840	1805	1860	1725						

### Average Daily

2015	55.8	56.6	57.1	58.2	58.6	57.2	56.0	55.0	53.8	53.6	53.8	54.4
2016	55.3	56.2	57.1	58.2	58.2	57.0	56.0	54.7	54.3	54.7	54.7	56.0
2017	57.0	58.4	59.4	60.2	60.0	57.5						

### Pct changes in number of cows

2016	-0.87%	-0.69%	0.00%	0.00%	-0.56%	-0.30%	-0.05%	-0.63%	0.92%	2.13%	1.54%	2.99%
2017	2.95%	3.83%	3.97%	3.42%	3.05%	0.88%						

### YTD (ave daily basis)

2016	55.3	55.8	56.2	56.7	57.0	57.0	56.9	56.6	56.3	56.2	56.0	56.0
2017	57.0	57.6	58.2	58.7	59.0	58.7						

YTD chg

2017	1.6	1.9	2.0	2.0	2.0	1.7						
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YTD pct chg

2017	2.95%	3.36%	3.58%	3.55%	3.45%	3.02%						
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# Exhibit 9: Monthly Milk Prices and Feed Costs

	PA				Feed Cost/cwt
	Class III	Class IV	All-Milk(1)	Higher of	
Dec-15	14.44	15.52	19.10	15.52	7.46
Jan-16	13.72	13.31	17.50	13.72	7.12
Feb-16	13.80	13.49	16.80	13.80	7.03
Mar-16	13.74	12.74	16.40	13.74	7.00
Apr-16	13.63	12.68	16.40	13.63	6.76
May-16	12.76	13.09	15.70	13.09	7.15
Jun-16	13.22	13.77	15.80	13.77	6.58
Jul-16	15.24	14.84	16.90	15.24	6.51
Aug-16	16.91	14.65	17.20	16.91	6.67
Sep-16	16.39	14.25	18.10	16.39	6.73
Oct-16	14.82	13.66	17.60	14.82	6.46
Nov-16	16.76	13.76	17.70	16.76	7.07
Dec-16	17.40	14.97	19.70	17.40	6.92
Jan-17	16.77	16.19	20.00	16.77	6.90
Feb-17	16.88	15.59	19.60	16.88	6.50
Mar-17	15.81	14.32	18.80	15.81	6.53
Apr-17	15.22	14.01	17.60	15.22	6.53
May-17	15.57	14.49	17.40	15.57	6.21
Jun-17	16.44	15.89	18.41	16.44	
Jul-17	15.50	16.64	18.17	16.64	
Aug-17	16.01	16.69	18.24	16.69	
Sep-17	16.39	16.85	19.00	16.85	
Oct-17	16.71	17.09	19.50	17.09	
Nov-17	16.82	17.10	19.53	17.10	
Dec-17	16.74	16.65	20.09	16.74	
Jan-18	16.56	16.20	19.88	16.56	
Feb-18	16.57	16.23	19.68	16.57	
Mar-18	16.53	16.28	19.32	16.53	
Apr-18	16.52	16.41	19.05	16.52	
May-18	16.56	16.47	19.09	16.56	
Jun-18	16.70	16.46	18.67	16.70	

These Class III and IV prices are from the CME close July 24, 2017.

### Recent Six Month Average Milk and Feed

Milk	Feed	
16.98	7.09	Dec '15 to May '16
18.85	6.60	Dec '16 to May '17
1.87	-0.49	Change
11.0%	-6.9%	Pct Change

### 2012-2016 Average Monthly Differences between PA All-Milk and 'Higher of'

Jan	3.324
Feb	3.114
Mar	2.794
Apr	2.526
May	2.530
Jun	1.974
Jul	1.534
Aug	1.546
Sep	2.152
Oct	2.408
Nov	2.432
Dec	3.352

2017-2018 Averages				
Sept to December	16.67	16.92	19.53	16.95
Sept to March	16.62	16.63	19.57	16.78
2016-2017 Averages				
Sept to December	16.34	14.16	18.28	16.34
Sept to March	16.40	14.68	18.79	16.40
pct chg				
Sept to December	2.0%	19.5%	6.9%	3.7%
Sept to March	1.3%	13.3%	4.2%	2.3%

(1) Shaded PA All-Milk prices are calculated from "higher of" and applicable monthly basis

Sources: Class prices from FMMO #1; PA All-Milk from USDA-NASS Quick Stats; Feed Cost/cwt from

"Dairy Outlook- June 2017", by Dr. Jim Dunn

Submitted: July 27, 2017

PADC Exhibit 9

# Exhibit 10: Grain and Hay Prices and Grain Bases for PA

these are historical CME closes

	<u>PA Corn</u>	<u>OH SB</u>	<u>PA Alf</u>	<u>PA Corn</u> <u>Basis</u>	<u>OH SB</u> <u>Basis</u>	<u>CME Corn</u>	<u>CME SB</u>	<u>CME SBM</u>				
Sep-14	3.69	11.1	204	0.4825	1.9675	3.2075	9.1325					
Oct-14	3.52	10.1	234	-0.2475	-0.3650	3.7675	10.4650					
Nov-14	3.75	10.4	223	-0.0075	0.2400	3.7575	10.1600					
Dec-14	3.95	10.6	240	-0.0200	0.4075	3.9700	10.1925					
Jan-15	4.11	10.7	242	0.4100	1.0900	3.7000	9.6100	329.90				
Feb-15	4.07	10.3	238	0.2250	-0.0075	3.8450	10.3075	353.70				
Mar-15	4.08	10.1	244	0.3175	0.3675	3.7625	9.7325	326.80				
Apr-15	4.06	9.83	245	0.4350	0.0450	3.6250	9.7850	318.90				
May-15	3.7	9.71	238	0.1850	0.3700	3.5150	9.3400	305.70				
Jun-15	3.94	10.1	244	-0.2000	-0.4625	4.1400	10.5625	359.50				
Jul-15	4.01	10.3	240	0.3000	0.4925	3.7100	9.8075	354.60				
Aug-15	4.08	10.2	205	0.4425	1.2250	3.6375	8.9750	320.90	14-15MY			
Sep-15	3.97	8.88	217	0.4925	-0.0400	3.4775	8.9200	308.30				
Oct-15	3.79	8.8	249	-0.0325	-0.0375	3.8225	8.8375	304.40				
Nov-15	3.77	8.83	253	0.1200	0.0200	3.6500	8.8100	284.60				
Dec-15	3.93	9.06	231	0.3425	0.3475	3.5875	8.7125	264.30	2015CY			
Jan-16	3.87	9.15	215	0.1500	0.3275	3.7200	8.8225	272.40				
Feb-16	3.86	8.87	211	0.3250	0.3400	3.5350	8.5300	259.30				
Mar-16	3.91	8.88	198	0.3950	-0.2275	3.5150	9.1075	270.30				
Apr-16	4.07	9.52	189	0.1675	-0.6900	3.9025	10.2100	332.10				
May-16	4.17	10	198	0.1225	-0.7850	4.0475	10.7850	396.60	9mo2016			
Jun-16	4.31	10.6	168	0.7225	-1.1500	3.5875	11.7500	405.30				
Jul-16	4.21	10.6	163	0.8650	0.2750	3.3450	10.3250	350.00				
Aug-16	3.97	10.3	182	0.9550	0.7000	3.0150	9.6000	312.20	15-16MY			
Sep-16	3.96	9.59	186	0.5925	0.0500	3.3675	9.5400	297.90				
Oct-16	3.88	9.44	200	0.3325	-0.5825	3.5475	10.0225	316.10				
Nov-16	3.87	9.68	192	0.5025	-0.6425	3.3675	10.3225	316.40				
Dec-16	4.05	9.89	199	0.5300	-0.0750	3.5200	9.9650	312.90	2016CY			
Jan-17	4.02	9.95	192	0.4225	-0.2950	3.5975	10.2450	334.60				
Feb-17	4.04	10.2	178	0.3725	-0.0500	3.6675	10.2500	332.60				
Mar-17	3.99	9.92	178	0.3475	0.4600	3.6425	9.4600	307.20				
Apr-17	4.29	9.51	180	0.7100	0.0575	3.5800	9.4525	311.70				
May-17	4.25	9.56	172	0.5300	0.4000	3.7200	9.1600	298.10	9mo2017			
Jun-17						3.7050	9.4225	304.40				
Jul-17						3.7275	9.6988	315.1500				
Aug-17						3.7500	9.9750	325.9				
Sep-17						3.7725	10.0250	327.8				
Oct-17						3.8175	10.0625	329.6				
Nov-17						3.8625	10.1000	331.1500				
Dec-17						3.9075	10.1306	332.7				
Jan-18						3.9450	10.16125	334.5				
Feb-18						3.9825	10.1919	335.0000				
Mar-18						4.02	10.2225	335.5				
Apr-18						4.0450	10.2450	335.7000				
May-18						4.07	10.2675	335.9				
Jun-18						4.0950	10.2963	336.6000				
Jul-18						4.12	10.325	337.3				
Aug-18						4.1250	10.31	336.9				
Sep-18						4.13	10.17	335.8				
The shaded are CME prices are at close on July 24, 2017. Prices from the months in between are interpolated from the nearest actual or futures price before and after.						2017-2018						
						Sept to	Dec	3.84	10.08	330.31		
							Mar	3.90	10.13	332.32		
						2016-2017						
						Sept to	Dec	3.45	9.96	310.83		
							Mar	3.53	9.97	316.81		
						pct changes						
						Sept	Dec	11.3%	1.2%	6.3%		
							Mar	10.5%	1.6%	4.9%		

Sources: Feed prices from USDA-NASS; CME closing prices from Futures.Tradingcharts.com; CME futures from CME.com

Submitted: July 27, 2017

PADC Exhibit 10