The Dairy Market Analyst

An Economic Analysis of Appalachian & Southeast Marketing Regions and Federal Milk Marketing Orders

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About this Report

Summary

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This document is intended to provide a comprehensive economic analysis of the Appalachian and Southeast Federal Milk Marketing Orders and areas. Included in this document is an evaluation of the changes in milk premiums in the region and an in-depth dive into supply and demand since 2000. Additionally, you will find a summary of federal milk marketing orders, including terminology and a description of the order rules.

In combing through these sections, you will arm yourself with the understanding and terminology to be able to discuss milk marketing in your region. Should you have any questions regarding the content of this report, please do not hesitate to reach out to me.



Introduction

Federal milk marketing orders have roots going back to the Great Depression and even earlier. In the 1930s, food security was a high-priority issue in the United States. As such, these regulations created financial incentives that were intended to "ensure adequate supplies" of milk to population centers.

Of those incentives, the most well-known is that organizations are rewarded financially for servicing fluid milk plants. However, there are also other incentives from federal milk marketing orders, perhaps less intended. For example, certain rules may, over time, incentivize manufacturing plants to be located in specific places, types of manufacturing plant investment, milk to be hauled from other regions, or dairy farmers to focus on certain genetic goals for their herds. Reforms to federal orders can change these incentives. Over the years, there have been many major and minor reforms.

This document aims to identify the structural changes in the Appalachian and Southeast marketing areas since the reforms in 2000. Furthermore, we hope to inform and raise the quality of the discussions surrounding federal milk marketing orders and the future of the dairy industry in the Appalachian and Southeast regions.

Section I: Economic Analysis of Federal Orders 5 & 7

Executive Summary

1. Compensation for milk in the Appalachian and Southeast regions has declined over the last decade.

- In 2010, average mailbox milk prices in the Appalachian region were \$3.69/cwt above Class III milk prices. By 2019, this difference had shrunk and mailbox milk prices averaged only \$1.33/cwt above Class III prices.
- In the Southeast order, compensation also declined from an average of \$4.13/cwt above Class III prices in 2010 to \$1.49/cwt above Class III prices in 2019.
- Compensation declined nationally during the 2010-2019 period, but the changes in the Southeast and Appalachian regions outpaced the national averages. In all federal orders, compensation dropped from an average of \$1.93/cwt above Class III prices in 2010 to \$1.01/cwt above Class III prices in 2019.

2. The Southeast and Appalachian milk production industries have declined over the last two decades, while dairy industries have grown in other parts of the USA.

- States in the Southeast order have experienced an 84% decrease in the number of operating dairy farms since 2000, a 50.8% decrease in the number of cows and a 37.3% decrease in milk production.
- Since 2000, states in the Appalachian order have experienced a 79.7% decrease in the number of operating dairy farms, a 31.1% decrease in the number of cows and an overall 6.1% decrease in milk production.
- The decrease in industry in the Southeast and Appalachian regions has, by all measures, outpaced national average declines. Since 2000, the number of dairy farms in the USA has only decreased by 67%, cow numbers have decreased by 1.5%, and milk production has <u>increased</u> by 30%.

3. To meet rising dairy consumption, the Southeastern industry has become increasingly reliant on dairy sourced from other parts of the country.

- Total milk-equivalent dairy consumption in the Appalachian and Southeast marketing areas has <u>increased</u> by more than 7.5 billion lbs since 2000, after including rising consumption of cheese, butter, and cultured dairy products.
- Despite rising demand, milk production <u>decreased</u> by a total of 3.6 billion lbs between 2000 and 2019 in states that are part of the Appalachian and Southeast marketing areas. The decline in milk production cannot be fully explained by the industry's reliance on fluid milk consumption. Fluid milk sales only decreased by an estimated total of 1.5 billion lbs in the two marketing areas.
- Southeastern milk processors have become more reliant on milk sourced outside of the marketing area.
 - In the Southeastern order, the order pool was made up of an estimated 21% of the milk produced in the marketing area in 2018, down from an estimated 33% in 2000.
- An increasing amount of packaged fluid milk is manufactured outside of the marketing areas and sold in the regions. In the Southeast and Appalachian marketing areas, an estimated 930 million pounds (12% of packaged fluid milk sales) were produced by plants in other federal milk marketing orders in 2019, up from an estimated 782 million pounds (8.9%) in 2015.

What are Federal Orders 5 and 7?



About Federal Order 5

Federal Milk Marketing Order 5, also called the Appalachian order, includes counties in eight states and has an estimated population of just under 24 million people (7.2% of the total USA population). The Marketing Area includes all of North Carolina and South Carolina; counties in northern Georgia, southern Indiana, eastern Kentucky, eastern Tennessee, and western Virginia, in addition to two counties in West Virginia.

About Federal Order 7

Federal Milk Marketing Order 7, called the Southeast order, includes counties in nine states and has an estimated population of just under 33 million people (10% of the USA population). The Marketing Area includes all of Alabama, Arkansas, Louisiana, and Mississippi; counties in northern Florida, Georgia, Kentucky, Missouri, Middle Tennessee and West Tennessee.

How Much are we Talking? Changes in Compensation

In the analysis below, "compensation" in the Appalachian and Southeast orders will be measured on a relative basis by comparing mailbox milk prices with: (1) the average mailbox milk prices in all federal milk marketing orders, (2) to Class III prices, and (3) to mailbox milk prices in other regions. Each of the comparisons show that compensation in the Appalachian and Southeast orders has declined for approximately a decade.

Federal Milk Marketing Order 5

Compared to average mailbox milk prices in all federal milk marketing orders, mailbox milk prices in the Appalachian region peaked in 2010 at \$1.76/cwt above the national average. The 2008-2011 time-

frame was a period with a leveling off in compensation ranging between \$1.20 and \$1.76/cwt above the national average. Beginning in 2011, compensation began to trend lower and by 2019 was only \$0.33/ cwt above the national average.

When comparing mailbox milk prices in the Appalachian region to Class III prices, the data tells a similar story. Mailbox milk prices in the Appalachian order peaked in 2010 at \$3.69/cwt above the average Class III price for that year. Differences have since shrank and were only \$1.33/cwt above Class III prices in 2019.

Mailbox milk prices in the Appalachian region have tended to converge with prices in neighboring regions. In 2001, Appalachian mailbox milk prices were



Comparing Mailbox Milk Prices in the Appalachian Region to Mailbox Milk Prices in Other Regions

\$2.07/cwt lower than mailbox milk prices in Florida, \$0.85/cwt above prices in Southern Missouri, and \$0.35/cwt lower than prices in the Southeast. By 2019, the differences had all decreased. Mailbox milk prices in the Appalachian order were only \$1.16/ cwt lower than in Florida's, \$0.02/cwt lower than in Southern Missouri, and \$0.16/cwt less than in the Southeast.

Federal Milk Marketing Order 7

In the Southeast, mailbox compensation peaked in 2008 at \$2.56/cwt above the national average. Prices began to decline thereafter and were only \$0.48/cwt above the national average by 2019.

When comparing to Class III prices, mailbox milk prices in the Southeast order peaked in 2010 at \$4.13/cwt above the average Class III price for that year. Prices trended lower thereafter and were only \$1.49/cwt above Class III prices in 2019.

Like the Appalachian region, mailbox milk prices in the Southeast have tended to converge with prices in other regions. In 2001, Southeast mailbox milk prices were \$1.72/cwt lower than mailbox milk prices in Florida and \$1.20/cwt above prices in Southern Missouri. By 2019, the differences had shrunk. Mailbox milk prices in the Southeast order were only \$1.00/ cwt lower than Florida's and \$0.13/cwt above mailbox prices in Southern Missouri.

Drivers of the change in compensation

Based on conversations with industry practitioners, we heard an array of explanations for the decline in compensation. We have listed them below. Some, but not all, of these explanations can be supported by data. Everyone we spoke to claimed multiple factors were responsible for the decline in compensation; our analysis supports this conclusion.

Reasons practitioners gave for the decline in mailbox compensation:

- 1. There was declining demand for fluid milk, resulting in less need for a local milk supply.
- 2. Surplus milk from other areas has flowed into the Appalachian and Southeast orders, including



Comparing Mailbox Milk Prices in the Southeast Region to Mailbox Milk Prices in Other Regions

from Kansas, Texas, New Mexico, and Michigan.

- 3. Transportation credits incentivized milk to be brought in from outside the area to the disadvantage of local milk supplies.
- 4. The opening of the Walmart fluid milk plant in Fort Wayne, IN in 2018 caused in-market premiums to fall in anticipation of additional fluid milk sourced from outside of the marketing area, taking share from milk produced locally.
- 5. Following the dissolution of the marketing agency in common, there was an increase in competitive behavior among milk cooperatives.

Economic Analysis

In the analysis below, we define "compensation" as the difference between annual mailbox prices in the order and average mailbox prices in all federal milk marketing orders.

The discussion of the economic models hereafter are intended to (a) identify which factors have affected mailbox prices in the Appalachian and Southeast orders, and (b) provide an estimate of the magnitude of those factors.

Appalachian Order

In the Appalachian order, mailbox compensation peaked in 2010 and declined thereafter. The peak coincided with the same year that fluid milk sales reached their high (also 2010). A single-factor regression model estimates fluid milk demand in the region explains about 15% of the variability of "compensation" (as defined at the start of this section) in the Appalachian order.

In other words, fluid milk consumption explains only a small part of the decline in mailbox compensation.

The data also indicates local supply is an important variable. Based on a two-factor regression model that includes as factors (1) estimated fluid milk consumption in the marketing area and (2) milk production in states that are part of the Appalachian order, the model improves and explains 39% of the variability in mailbox compensation. This is in line with the practitioner views that fluid milk demand and local milk production are important factors to farmgate milk prices, but does not fully explain the change in mailbox compensation.



There is also evidence that surplus milk supplies from other areas have pressured mailbox prices in the Appalachian region. Based on a three-factor regression model that includes as factors (1) estimated milk consumption in the marketing area, (2) milk production in states that are part of the Appalachian order, and (3) milk production in Florida, Kansas, Texas, New Mexico, and Michigan, the model improves and explains 49% of the variability in mailbox compensation in the Appalachian region.

The models provide additional evidence to support several of the practitioner claims, including that fluid milk consumption, local milk production, and surplus production in other states have affected mailbox compensation. However, it is important to recognize that with more than a third of the variability left unexplained, that there are other factors affecting mailbox compensation.

Southeast Order

In the Southeast order, mailbox "compensation" (as defined on Page 9) peaked in 2008 and has trended lower since then. Fluid milk sales have declined rapidly since 2010. Based on a single-factor regression model, we estimate fluid milk demand explains about 40% of the variability of compensation in the Southeast order.

Local supply is also an important variable. Based on a two-factor regression model that includes (1) estimated fluid milk consumption in the marketing area and (2) milk production in states that are part of the Southeast order, the model improves and explains 66% of the variability in mailbox "compensation." However, the model does not improve when adding milk production in other surplus states.

A separate model that performs about as well is a two-factor regression model that includes (1) estimated milk consumption in the marketing area and (2) milk production in Florida, Kansas, Texas, New Mexico, and Michigan, but does not include local milk supplies. That model explains 61% of the variability in mailbox compensation. Please note, the regression models detailed above do not tell the complete story on milk compensation. However, they do provide clues as to where to look for causes and drivers of the evolution in compensation. Further in-depth research on this topic would likely be informative, but is outside the scope of this study.

Mailbox Milk Prices

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Appalachian (KY, NC, SC, TN, VA)	13.69	15.67	12.60	12.87	16.21	15.26	13.51	20.02	20.12	14.05	18.09	21.65	19.47
Corn Belt States	N/A	14.35	11.66	11.83	14.80	14.03	12.21	18.28	17.78	12.56	16.02	19.83	18.11
Florida	15.76	17.74	15.23	15.12	18.26	17.64	16.08	21.98	22.29	15.89	19.55	23.32	21.26
lowa	N/A	N/A	N/A	12.47	16.02	15.08	12.87	18.83	18.24	13.04	16.41	20.26	18.94
Illinois	N/A	14.58	11.91	12.49	16.12	15.14	12.84	19.11	18.48	12.99	16.56	20.63	19.08
Indiana	N/A	N/A	N/A	N/A	16.02	15.05	12.98	19.29	18.77	12.96	16.86	20.44	18.06
Michigan	N/A	14.61	11.70	12.06	15.57	14.78	12.65	18.52	18.14	12.64	16.36	20.11	17.91
Minnesota	N/A	14.58	11.83	12.66	16.29	15.11	12.82	19.09	18.68	13.03	15.75	19.99	19.20
Missouri (Southern)	N/A	14.82	11.97	12.28	15.61	14.69	12.57	18.95	18.84	12.53	16.45	20.14	18.05
New England States (CT, ME, MA, NH, RI, VT)	N/A	N/A	N/A	N/A	N/A	N/A	13.47	20.14	19.14	13.61	17.50	21.35	19.63
New Mexico	N/A	13.84	11.07	11.14	14.09	13.24	11.13	17.54	16.33	11.17	14.81	18.31	16.67
New York	N/A	N/A	N/A	N/A	N/A	N/A	13.07	19.24	18.07	12.77	16.33	20.00	18.57
Northeast	12.51	14.94	11.88	12.54	16.32	15.40	N/A						
Ohio	N/A	14.83	11.90	12.35	15.87	15.07	13.04	19.34	18.83	13.41	17.23	20.85	18.68
Pacific Northwest (OR & WA)	11.78	14.23	11.57	11.35	14.70	14.02	12.19	18.42	17.25	12.11	15.71	19.86	18.05
Pennsylvania (Eastern)	N/A	N/A	N/A	N/A	N/A	N/A	13.42	19.77	18.60	13.15	17.05	20.86	18.95
Pennsylvania (Western)	N/A	N/A	N/A	N/A	N/A	N/A	13.06	19.37	18.76	13.06	17.12	20.93	18.88
Southeast (AL, AR, GA, LA, MS)	12.92	16.02	13.18	13.49	16.81	16.00	14.46	20.66	20.94	14.62	18.54	22.11	20.04
Wisconsin	N/A	14.68	12.02	12.64	16.56	15.36	13.07	19.01	18.63	12.87	15.98	20.06	19.16
Western Texas	N/A	14.78	12.01	12.08	15.17	14.06	N/A	18.30	17.20	11.98	15.70	19.35	17.60
All Federal Order Areas	N/A	14.78	11.91	12.34	15.93	14.99	12.87	19.02	18.38	12.85	16.34	20.20	18.63

Source: FMMO 30

Mailbox Milk Prices (cont'd)

	2013	2014	2015	2016	2017	2018	2019
Appalachian (KY, NC, SC, TN, VA)	21.23	25.45	17.94	16.52	18.11	16.32	18.29
Corn Belt States	19.28	22.97	16.06	15.28	16.43	14.79	16.91
Florida	23.02	27.13	19.20	17.34	19.01	17.80	19.45
lowa	20.35	24.52	17.09	16.36	17.71	16.26	18.39
Illinois	20.35	24.52	17.33	16.39	17.96	16.32	18.52
Indiana	19.97	23.55	16.46	15.78	17.03	15.20	17.67
Michigan	19.76	23.47	16.05	14.33	15.61	14.18	16.52
Minnesota	19.93	24.28	17.44	16.65	17.61	16.24	18.98
Missouri (Southern)	20.31	24.80	17.88	16.38	17.61	16.27	18.31
New England States (CT, ME, MA, NH, RI, VT)	21.51	25.42	18.56	17.29	18.66	16.98	19.03
New Mexico	17.96	21.51	15.03	14.43	15.27	13.79	16.16
New York	20.50	24.54	17.21	15.97	17.47	15.84	17.97
Northeast	N/A						
Ohio	20.53	24.20	17.32	16.07	17.64	15.63	17.92
Pacific Northwest (OR & WA)	19.75	23.74	16.43	15.83	17.61	16.22	18.51
Pennsylvania (Eastern)	20.60	24.51	17.16	16.05	17.40	15.62	17.86
Pennsylvania (Western)	20.45	24.45	17.32	16.10	17.69	15.81	18.18
Southeast (AL, AR, GA, LA, MS)	21.61	25.89	18.20	16.37	17.62	16.26	18.45
Wisconsin	20.07	24.27	17.67	16.66	17.97	16.27	18.60
Western Texas	19.00	22.71	16.06	15.33	16.79	15.38	17.75
All Federal Order Areas	20.07	24.06	17.01	15.98	17.32	15.73	17.96

Source: FMMO 30

A Supply Analysis of Orders 5 & 7

The Southeast milk production industry has declined over the last two decades, while dairy industries have grown in other parts of the USA.

Milk production in states that make up at least part of the Appalachian marketing area (Order 5) have declined by a total of 6.1% since 2000 (-652 million lbs). The declines were concentrated in Tennessee (-854 million lbs), Kentucky (-754 million lbs) and Virginia (-410 million lbs). Growth occurred in states that made up comparably small geographic shares in the marketing area, including Georgia (+338 million lbs) and Indiana (+1.654 billion lbs). On a percentage basis, milk production decreased by 66% in West Virginia, 61% in Tennessee, 44% in South Carolina, 24% in North Carolina and 22% in Virginia.

Milk production in states that make up at least part of the Southeast marketing area (Order 7) has declined by a total of 37% since 2000 (-4.2 billion lbs). The declines were concentrated in Missouri (-1.12 billion lbs), Tennessee (-854 million lbs), Kentucky (-754 million lbs), Louisiana (-563 million lbs), Arkansas (-418 million lbs), and Mississippi (-415 million lbs). Dairy industries in several states have been devastated. On a percentage basis, milk production decreased by 86% in Arkansas, 83% in Alabama, 81% in Louisiana, 77% in Mississippi, 61% in Tennessee, and 44% in Kentucky.



-68% 66% -63% -60% -63% -62% -51% -68% -73% -70% -46% -65% -73% -72% 83% -65% -92% -79% -84% -68% -88% -84% -96% -84% -88% -92% -83% -87% -83% Source: Milk Production Annual

Changes in Number of Farms, 2000-2019

Consolidation has outpaced the national average.

In the Appalachian region, the consolidation trend has been more severe than in the rest of the country. For example, in West Virginia, there were 92% fewer dairy farms in 2019 than there were in 2000. In Tennessee, 88% fewer farms, and in North Carolina, South Carolina, and Kentucky, 84% fewer. These levels of consolidation outpaced the national average of 67% fewer dairy farms in the dairy business between 2000 and 2019.

In the Southeastern region, the consolidation was even more severe than in the rest of the country. For example, in Arkansas there were 96% fewer dairy farms in 2019 than there were in 2000; in Alabama, 92% fewer farms; in Mississippi, 88% fewer; Tennessee, 88% fewer; and Kentucky, 84% fewer. Since 2000, population has increased by 20% in the Appalachian marketing area - a contributing factor to total consumption of all dairy products rising by 3.4 billion lbs of milk-equivalent between 2000 and 2018. In the Appalachian marketing area, fluid milk consumption declined by about 543 million lbs between 2000 and 2019. That decrease is comparable to the 652 million lb total decrease in milk production the occurred in states in the marketing area in the 2000-2019 time period.

Population has increased by 15% in the Southeastern marketing area since 2000, contributing to total consumption of all dairy products rising by 4.1 billion lbs of milk-equivalent between 2000 and 2018. Meanwhile, fluid milk consumption in the Southeastern marketing area declined by about 1.0 billion lbs between 2000 and 2019. That decline is also a fraction of the 4.2 billion-lb total decrease in milk production that occurred in states in the marketing area in the 2000-2019 time period.



Source: FMMO 30, ERS Availability, Census Bureau Population, USDA Milk Production Annual

A Demand Analysis of Orders 5 & 7

Per Capita Demand of Dairy Products



Source: ERS Availability

Trends in per capita consumption

Per capita fluid milk consumption has been decreasing while consumption of other dairy products, including cheese, butter and cultured products, has risen.

In 2019, per capita fluid milk consumption equaled 141 lbs per person, a decrease of 56 lbs since 2000 (-28%). On average, fluid milk consumption is decreasing by about 4 lbs per year.

In the Appalachian order, that equates to about 90 million lbs less fluid milk demand per year (the annual milk production of 4,279 cows) and in the Southeast order, 125 million lbs less fluid milk demand per year (the annual production of 6,780 cows).

But demand for other dairy products has contributed to rising demand for all dairy. Total milk-equivalent consumption (which includes dairy in all products) increased by about 3.4 billion lbs between 2000 and 2018 in the Appalachian order and is growing around 133 million lbs per year. In the Southeast order, milk-equivalent demand has grown by a total of 4.1 billion lbs between 2000 and 2018 and is rising around 137 million lbs per year.

The dairy products that are experiencing demand growth are not the ones that are typically manufactured in the Appalachian and Southeast areas. Between 2000 and 2018, consumption of cheese in-

Percentage Change in Total

Demand by Product, 2000-2018							
	Appalachian Marketing Area	Southeast Marketing Area					
Population	20%	15%					
All Dairy (fat-basis)	29%	24%					
Fluid Milk	-12%	-15%					
Ice Cream	-4%	-8%					
Yogurt	145%	135%					
Cheese	53%	47%					
Butter	55%	48%					
	<0 0-20 20-50	50+					







Change in Consumption by State, Federal Order 5

Source: ERS Availability, Census Bureau, USDA Fluid Milk Estimates



Change in Population in Federal Orders 5 & 7, 2000-2019

creased by about 307 million lbs in the Appalachian area and 393 million lbs in the Southeast.

Consumption of butter has risen by a total of about 48 million lbs in the Appalachian area and 62 million lbs in the Southeast marketing area; consumption of yogurt has grown by 186 million lbs in the Appalachian area and 251 million lbs in the Southeast.

Population growth is a tailwind

In the Appalachian marketing area, total population has increased by about 4 million people (+20%) between 2000 and 2019. Population in the region is increasing around 0.9% per year (about 200 thousand additional people). Growth has been concentrated in North Carolina and South Carolina.

In the Southeast marketing area, total population has increased by about 4.3 million people between 2000 and 2019 and is also rising by about 200,000 additional people per year (a growth rate of 0.6%).

Trends in Milk Movements

Milk Movements in the Appalachian order

Milk movements in the Appalachian order were relatively consistent in the 2000-2019 time period.

Several states have counties that are part of the Appalachian marketing area including Georgia, Indiana, Kentucky, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

In 2000, 84% of the pooled milk in Federal Milk Marketing Order 5 was produced on farms in states that are part of the marketing area. In 2005, 2006, and 2010, that number had decreased to 75%. But over the last decade, that number has climbed and in 2019 84% of the Producer Milk in the Appalachian region was again produced on farms in states that are part of the marketing area. Production and demand in the Appalachian order also have significant seasonality. Typically, Producer Milk from within the marketing area peaks in May and is at its low point around September. Producer Milk from outside of the marketing area peaks in September to fill the gap between local supply and demand and is at its low point around May. Since 2009/10, in-area milk has made up an increasing share of the Appalachian order. In 2019, in-area milk made up an estimated 87% share of the order in May and an 82% share in September.

The Appalachian order has been relatively stable in terms of in-area vs. out-of-area milk, but there have been some significant changes in milk movements within the marketing area. Kentucky's share of Producer Milk shrank from 18% in 2000 to 7.9% in 2019. Tennessee's share dropped from 12% to 6.5%. Virginia's share grew from 7.7% in 2000 to 26.6% in 2019 and Georgia's, 3.5% in 2000 to 7.2% in 2019.





The Southeast has become more reliant on milk from outside of the area between 2000 and 2019.

Milk movements in the Southeast order changed significantly in the 2000-2019 time period. Several states have counties that are part of the Southeast marketing area including Alabama, Arkansas, Kentucky, Florida, Georgia, Louisiana, Mississippi, Missouri and Tennessee.

During the 2000-2019 timeframe, the region became much more dependent on milk from outside of the marketing area as milk production in states in the marketing area decreased by a total of 37%.

Between 2000 and 2019, county-level data show Producer Milk moved away from Arkansas, Alabama, Louisiana, and Mississippi. It shifted west to Kansas and Western Texas, and north to Indiana.

Using county-level data published by FMMO 7 – (which is an indicator but does not tell the complete picture because data from some counties are restricted due to too few producers) in December 2000, 33% of the pooled milk in Federal Milk Marketing Order 7 was produced on farms that USDA reported were in counties in the marketing area. By December 2018, USDA reported only 21% of the Producer Milk pooled on the order was produced on dairy farms in the Southeastern marketing area.

Based on the county-level data, the Southeast order was split as follows: Georgia's share of the Southeast order was 16.4% in 2018 (up from 9.5% in December 2000); Kansas's share was 16.2% (up from 3.7% in 2000); Indiana's share was 12.6% (after being unreported in 2000); Kentucky's share was 9.7% (an increase from 6.7%); Tennessee's share was 3.9% (down from 7.7% in 2000); Louisiana's share was 2.7% (down from 8.8% in 2000); and Alabama's share was 1.3% (down from 4.2% in 2000). Missouri's share has been largely unreported since 2016. Previously, it held a 14% share in 2015, down from a 17.8% share in 2000.

USDA also shared state-level statistics with fewer restricted data points. The Southeast order was split as follows: Georgia had a 21% share of the Southeast order in 2019 (up from 10% in 2000); Texas, a 14% share (down from 16% in 2000); Indiana, a 13% share (after being mostly non-reported in 2000); Kentucky, a 10% share (up from 7% in 2000); Tennessee, a 4% share (down from 8% in 2000); and Alabama, a 1% share (down from 4% in 2000). Kansas had a 9% share in 2019, up from a 3% share in 2003. Prior to 2003, data from Kansas was not regularly reported.

Milk Movement Time Series Snapshot, Federal Order 7, 2000-2018



Milk Movement Time Series Snapshot, Federal Order 5, 2000-2018



Source: FMMO 5 December County-level Data, Restricted Counties not included.

Route Dispositions

Fluid milk sales coming in from outside the area.

Fluid milk processors in the Appalachian and Southeast marketing areas compete with a significant amount of packaged milk produced in other federal milk marketing orders. In total, packaged fluid milk from other federal orders (other than orders 5 & 7) totals just under one billion lbs of milk annually (930 million lbs) or approximately 12% of all fluid milk sales into the marketing area. The limited data available suggests the share of milk is increasing. In 2015, an estimated 9.1% of fluid milk sales came from other federal milk marketing orders (782 million lbs).

Federal Milk Marketing Order 33 (the Mideast order which includes Michigan and Ohio) has been the source for most of the increase in packaged milk from outside the area. Sales have increased from 248 million lbs in 2015 to 490 million lbs in 2019. Packaged milk sales from other orders have declined from a total of 534 million lbs in 2015 to 441 million lbs in 2019.



Packaged Fluid Milk Sold in the Southeast and Appalachian Marketing Areas from other Marketing Orders (Million Lbs)



Section II: Original Federal Order Policy Intentions

Orders 5 & 7: Original Intentions

This history is based on our conversations with several industry practitioners that participated in the reform process, as well as analysis of public documents.

The reform of federal milk marketing orders, which occurred in the late 1990s, was driven not so much by the industry - according to industry accounts - but by one Congressman: Steve Gunderson, representative of Wisconsin's 3rd District. Mr. Gunderson was re-elected in the November 1994 general election and was appointed chairman of the Livestock, Dairy and Poultry subcommittee.

Mr. Gunderson pushed for reforms of a multitude of dairy regulations, including federal milk marketing orders and price-support programs. One fruit of his efforts was the 1996 Farm Bill section titled "CON-SOLIDATION AND REFORM OF FEDERAL MILK MARKETING ORDERS." That section of the Farm Bill instructed USDA to "limit the number of Federal milk marketing orders to not less than 10 and not more than 14 orders." At the time of passing, there were 31 federal milk marketing orders throughout the country.

It also instructed USDA to review the Class I differentials and replace the Minnesota-Wisconsin price series with end-product pricing.

USDA was given a timeline – two years – to reform federal orders. In the end, it took USDA a bit longer than that to achieve the reforms, and they were implemented in January 2000.

The Farm Bill also included additional instructions – USDA was to use the "Informal Rulemaking process" to generate the federal milk marketing order reforms. The Informal Rulemaking process is quicker than the Formal Rulemaking process. In the Informal Rulemaking process, 1) USDA recognizes that a regulation needs to be issued or changed. It 2) solicits feedback from the industry and 3) publishes a proposed rule, providing time for public comment, before 4) issuing a final rule.

In comparison, in the "Formal Rulemaking" process, USDA 1) announces a public hearing and 2) receives requests for USDA data. 3) They accept advanced witness testimony and 4) hold a public hearing. 5) USDA then uses only the information received in the public hearing to issue a recommending decision, which is put out for comment. 6) Then USDA issues a final decision, which is put out for referendum. Producers can either vote to accept the changes to the federal milk marketing order or reject the federal order, prompting the region to become unregulated.

Key Intentions

During the reforming process, there were several priorities that were discussed publicly related to the various federal milk marketing orders. One of the key hot-button items at the time was related to perceived fairness. Cooperatives in the Upper Midwest felt disadvantaged by the federal milk marketing order system; Class I differentials were higher in the East and lower in the Midwest. This created consternation within parts of the industry and a perception that the federal milk marketing orders were not equitably treating some producers. More equitable Class I differentials were a key part of the reforms.

There were also several other issues that reforms were intended to address. In several regions, processors had sales in multiple federal milk marketing orders but were sourcing milk from some of the same producers. There was an argument to be made that consolidation in the industry had caused many orders to "overlap."

Furthermore, in some regions, packaged milk was increasingly moving between federal milk marketing orders. This meant that Class I processors that were regulated differently were increasingly competing against each other for Class I sales. As such, the regulations were affecting the ability of many Class I processors to compete.

Thirdly, due to consolidation among processors and producers, it was becoming increasingly difficult to get accurate statistics in some marketing areas. When there were less than two or three producers in an area, USDA would restrict the data because it was considered proprietary. By making federal orders larger, USDA would be able to generate statistics that provided more transparency.

Fourthly, it is important to acknowledge the role that self-interest plays in the reform process. The federal order rules, no matter how they are changed, will always benefit certain individuals and organizations, in some cases certain individuals within organizations, over others. Competing interests included cooperative members vs. independent producers, producers in the marketing area vs. those outside of it, processors vs. producers. The reform objectives of self-interest are not usually acknowledged in public forums.

In the Southeast and Appalachian regions, self-interest underpinned debate on certain oft-visited themes. There was significant debate about the equitable cost of balancing milk – including the cost of bringing in milk during periods when local milk supplies were not sufficient to supply Class I demand, and how those costs were shared. Those debates included transportation credits, diversion limits, and performance standards.

Now, there were several principles that the reforms were not intended to change. Federal milk marketing orders were still supposed to 1) ensure an adequate supply of beverage milk for consumers and processors, 2) provide appropriate market signals to farmers, 3) recognize the value of milk by location, and 4) facilitate orderly marketing.

Section III: Understanding Federal Orders

Key Terminology

Producer Milk

Producer Milk is milk that meets the rules to be part of a federal milk marketing order pool. This is the first term described in this document because it is the most important. The federal milk marketing order pool is only made up of "Producer Milk." And the rules of the order determine whose milk (and how much) can qualify as "Producer Milk."

Producer Milk includes all milk delivered to "Pool Distributing Plants" and "Pool Supply Plants" – terms that will be described below.

Three Key Types of Handlers

Handler is the technical term for an organization that buys or markets raw milk and participates in the federal milk marketing order. USDA identifies three main types of Handlers:

1. Pool Distributing Plants: the name for Class I manufacturers that participate in the pool. Class I manufacturers produce packaged fluid milk products.

To qualify as a Pool Distributing Plant in Federal Orders 5 and 7, the plant must process at least 50% of milk received at the plant into Class I products and 25% of its Class I sales must be in the marketing area.

All of the milk processed at a Pool Distributing Plant will qualify as Producer Milk and will be part of the order pool.

Additionally, Pool Distributing Plants are the only plants that will generate "diversions." That term will be explained in detail later on. 2. Pool Supply Plants: other dairy facilities that ship enough milk to Pool Distributing Plants to qualify. The name "Supply Plant" comes from the idea that these plants will balance (i.e. supply) milk to the Pool Distributing Plants.

To qualify as a Pool Supply Plant in Federal Orders 5 and 7, a plant must ship at least 50% of its milk receipts to a Pool Distributing Plant. A cooperative-owned plant located in the marketing area may also qualify as a Pool Supply Plant if at least 60% of producer milk from the cooperative members is delivered to Pool Distributing Plants.

All of the milk handled by Pool Supply Plants are eligible to be "Producer Milk."

3. Cooperatives: made up of three or more farmers. In a federal milk marketing order, cooperatives are granted certain rights that individual farmers are not.

Partially Regulated Plant

A "**Partially Regulated Plant**" is a facility that has some Class I sales but not enough to meet the threshold to be a Pool Distributing Plant. Milk that is shipped to a Partially Regulated Plant is not automatically Producer Milk and, as such, is not automatically part of the federal order pool.

At a Partially Regulated Plant, the processor still must pay federal milk marketing order minimum prices to their suppliers, including the location differentials, for any milk manufactured into Class I products. However, these processors are permitted to price differently the milk manufactured into products other than Class I.

Non-pool Plants

There are many types of **"Non-pool" plants**. The term reflects the idea that these facilities do not automatically qualify to be part of the pool. In other words, milk handled by Non-pool plants does not automatically qualify as "Producer Milk."

A Non-pool plant can be a plant:

- 1. Fully regulated under a different federal milk market order
- 2. A vertically integrated processor/dairy farm called a producer-handler
- 3. A Class I processor that falls short of the requirements to be a Pool Distributing Plant, which is called a "Partially Regulated Distributing Plant."
- 4. An unregulated manufacturing plant
- 5. An exempt distributing plant (less than 150,000 lbs of packaged sales, operated by government or college with no commercial sales, or operated for charitable purposes).

Milk delivered to "Non-pool Plants" may qualify as "Producer Milk" using "diversions."

Diversion Limits and Diversions

"Diversion Limits" is USDA's term for the maximum volume of milk that can be delivered to "Nonpool plants" and still qualify as "Producer Milk." A Handler earns diversions by delivering milk to a Pool Distributing Plant so long as that milk did not utilize transportation credits. Depending on the month, a Handler will receive diversions equal to 25% to 35% of the milk volume that was delivered to a Pool Distributing Plant.

In the Appalachian and Southeast orders, diversion limits are set at 25% in July thru November as well as January thru February, and 35% in the remaining months. The Handler may use the diversions at a Non-pool plant to qualify milk as Producer Milk and be eligible to draw funds out of the pool. Here's how diversions work: if a Handler delivers 100 lbs of milk to a Pool Distributing Plant, the order rules permit them to pool additional milk (i.e. diversions) equal to 25-35 lbs, depending on the month.

The idea behind diversions and diversion limits is that they reflect the necessary reserve supplies needed to balance Pool Distributing Plants in the marketing area. This is why only milk delivered to Pool Distributing Plants (not Pool Supply Plants) will create diversions.

From a Non-pool plant's perspective, these diversions can at times be a lucrative proposition. On diverted milk, a Handler will draw money out of the order pool. This benefit is incurred even though it did not have the additional cost of delivering milk to a Pool Distributing Plant or a Pool Supply Plant. A cost-benefit analysis will determine a Non-pool plant's participation in the pool.

From an overall order perspective, restrictions on diversions, called "Diversion Limits," affect the amount of non-Class I milk in the pool. The higher the diversion limits, the more non-Class-I milk that can be "Producer Milk" and, generally speaking, the lower the pool blend milk price.

Performance Requirements: What Milk has to do to be Producer Milk

Performance requirements are the standards that milk must meet to qualify as Producer Milk.

The first performance requirements to discuss are called "delivery day requirements" and are also referred to in the industry as "touch base requirements." These are the requirements related to how much milk a farm must deliver to a Pool Distributing Plant or Pool Supply Plant to qualify milk as Producer Milk.

In Federal Milk Marketing Orders 5 and 7, milk from a farm must "touch base" at least 1 day per month.

This means that a minimum of 1 days' production from the farm must go to a Pool Distributing Plant or a Pool Supply Plant. The touch-base requirements ensure that the "diverted" milk provides an order-specified level of service to Pool Distributing Plants and Pool Supply Plants.

For example, if a producer ships 3.0 million lbs of milk in a month, it must deliver at least 100,000 lbs (1/30th) of milk to either a Pool Distributing Plant or a Pool Supply Plant to be able to qualify the milk as Producer Milk. The milk that is shipped to a Non-pool plant will then be eligible for diversions. If a handler has available diversions that it earned by supplying milk to a Pool Distributing Plant, it may use them to pool milk - that met the performance requirements to be Producer Milk - at the Non-pool plant.

The delivery day requirements vary by Federal order. For example, in Federal Milk Marketing Order 6 (Florida), milk must "touch base" at least 10 days per month. 10 days is more restrictive than 1 day.

There are also other performance requirements including that milk must be Grade A, meaning no Grade B milk is permitted to qualify as Producer Milk. Grade A milk has more stringent health standards than Grade B milk. Additionally, in some orders there are limitations on when a Handler is permitted to pool milk.

Understanding Obligations & Draws from the Pool

Uniform Skim Milk and Uniform Butterfat Prices

The equations in federal milk marketing orders play an essential role in determining an organization's payment to (or draw from) the federal milk marketing order each month. These equations establish values for raw milk depending on how it is manufactured.

There are separate equations to value the components of the milk (skim milk and butterfat) processed into Class I (gallons, half-gallons, etc), Class II (yogurt, ice cream, etc.), Class III (cheese, etc.), and Class IV uses (milk powder, butter, etc.).

The federal order pool is the total value of Class I, Class II, Class III, and Class IV skim milk and butterfat that met the performance requirements of the order, qualified as producer milk, and was pooled by the handlers during the month.

Each month, USDA calculates a weighted average value for all of the skim milk in the pool, called the Uniform Skim Milk Price, and a weighted average value for all of the butterfat in the pool, called the Uniform Butterfat Price.

In four of the 11 federal orders, including Orders 5, 6, 7, and 131, milk is pooled using skim milk and butterfat pricing. In the seven other orders, milk is pooled differently using protein, fat, and other solids values.

Calculating Obligations and Draws

This is where all of the rules, behavior among participants, and commodity market prices come together to determine the cash flows for Producer Milk in the order. In the Appalachian and Southeast orders, an organization's obligation to pay to or draw from the order pool of Producer Milk in a month is calculated as the difference between the following:

Valuing the Handler's skim milk and butterfat that was qualified as Producer Milk using the appropriate formulas (Class I mover, Class II, Class III, Class IV) and location differential for the plant where the milk is first received.

And

The Uniform Skim Milk and Butterfat prices calculated by the federal milk marketing order. To calculate the Uniform prices, order officials compute a weighted average value for skim milk and butterfat in the pool. As part of this calculation, they solve for a location adjustment that factors into both the Uniform Skim Milk Price and the Uniform Butterfat Price.

This location adjustment is critical. It is a mathematical calculation that ensures that, after draws from and obligations to the pool, the value of Producer Milk with identical components will be the same if delivered to plants in the same pricing zone. Additionally, Producer Milk with identical components but in different pricing zones will have a price difference that is equal to the difference in the location differentials.

Also, please note that the draw or payment will depend on where the milk is processed, not the location of the dairy farm. Because federal law regulates a location differential for each plant (see map on final page), and each plant has a unique product mix, the payments and draws from the federal order will differ substantially by plant.

Payments to Producers and Cooperatives

Federal milk marketing order rules also dictate that a Handler must pay suppliers of pooled milk at least the Uniform Skim Milk Price and Uniform Butterfat Price, adjusted for the location that the milk was first received.

Cooperatives are given the freedom to choose to pass along to their members all, some, or none of the draws from, or obligations to, the federal milk marketing order.

The federal milk marketing orders regulate milk delivered to Pool Distributing Plants and Pool Supply Plants. Milk that is unregulated, meaning it does not qualify as Producer Milk and is not Class I milk, may be priced differently.

Transportation Credits

In Federal Milk Marketing Orders 5 and 7, there is also a separate system of transportation credits. Transportation credits are funded by assessments on Class I processors: the maximum rates are \$0.15/ cwt in FMMO 5 and \$0.30/cwt in FMMO 7. These funds are not shared across the pool. Rather, the money is earmarked for Handlers that supply milk from outside the marketing area.

The orders have a formula to calculate transportation credit payments based on the number of miles the milk was shipped, the cost of fuel, and amount of money in the transportation credit balancing fund. In effect, the transportation credit system can be thought of as an additional fee that processors pay on Class I milk. These monies are only provided to out-of-area milk (called "Supplemental Milk" in FMMO terminology). Producers located within the order marketing area are not eligible to receive transportation credits from the order.

Some Types of Maneuvering

Sometimes Handlers from several states away will find it economical to meet the performance provisions to qualify Producer Milk on an order.

The performance provisions may also permit Handlers to jump in and out of the order based on their economic analysis of the benefits and costs at that time.

If a processor chooses not to participate in a federal order and does not have fluid milk sales, then there are no federal constraints on milk prices. Many parts of the USA are like this and are unregulated, including Utah and Nevada.

If a handler is located in an unregulated area but supplies milk to a region with a federal order, then that milk may become regulated. For example, a processor located in Utah may supply milk to a Pool Distributing Plant, earn diversions, and pool milk.

Some states that have a federal milk marketing order also have significant amounts of milk that are not pooled. An example of this is in California, where cheese plants have created customized milk pricing formulas that deviate significantly from federal milk marketing order pricing.

Depending on the Uniform prices and the product mix of a plant, sometimes a manufacturer will find it to be more economical to be a Partially Regulated Distributing Plant than to be a Pool Distributing Plant.

To Read through the Federal Milk Marketing Order Language:

The federal regulations can be found here: https://www.ecfr.gov/cgi-bin/text-idx?SID=7b-93b3a582d5bfa790270c8639e838c5&tpl=/ecfrbrowse/Title07/7chapterX.tpl

The language of the Appalachian order can be found here: http://www.malouisville.com/linkeddocs/5ordlang.pdf

The language of the Southeast order is here: http:// www.fmmatlanta.com/Misc_Docs/Language_ FO7%20May_14.pdf





