

## **Dairy Price Index (DPI) methodology for pricing Wholesale Milk**

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### **The system is broken**

Not only is the volatility in the wholesale price of milk ludicrously high, the price paid to the dairyman is consistently too low, particularly relative to the processor and retailer. The extreme volatility and the consistently too low price is a result of regulation that has been patched together for decades and is clearly not optimizing U.S. citizens tax dollars. The current methodology is not transparent and is entirely too complex. Similar to the derivatives market on Wall Street, the more complex the regulations, the more loopholes to be exploited.

### **A better system: The Dairy Price Index (DPI)**

The price of wholesale milk paid to the dairy farmer should be calculated using the “**Dairy and related products**” section of the Consumer Price Index (CPI). This methodology would more accurately **balance supply and demand, is simple and transparent, would be cost effective from a regulatory perspective and would be driven by the consumer.**

### **The information is credible**

The Bureau of Labor Statistics (BLS) collects goods and service prices and publishes thousands of CPI indexes each month, including the headline All Items CPI for All Urban Consumers (CPI-U). These prices for goods and services are collected in 87 urban areas throughout the country and from about 23,000 retail and service establishments. The CPI Indices are widely used throughout the world. For example, they are used in the pricing of financial securities and inflation indexing for social security payments. The CPI information is also calculated by region in the country; Northeast, Midwest, South and the West. For more information on the CPI see: <http://www.bls.gov/cpi>.

### **A very good sample of food made from milk**

The “Dairy and related products” component of the CPI represents roughly 1% of the entire CPI and includes a notable 2,500 products including; fresh whole milk, cheese, ice cream, frozen yogurt, ice cream sandwiches, powdered milk, evaporated milk, condensed milk, smoothies, yogurt, egg nog, half and half, ice milk and 2,487 other products. These products are priced every single month of the year in all major areas of the United States. Importantly, this pricing information would be collected from an independent source. We will refer to this “Dairy and related products” component as the “Dairy Price Index” or DPI.

### **DPI Methodology**

Each month the BLS would send the DPI to the United States Department of Agriculture (USDA). The USDA would then calculate the price of wholesale milk based on the percentage change in the DPI. The USDA would post this information on their public website for anyone including the dairyman to view. Accordingly, simplicity and transparency is achieved unlike the current system.

The first month a “base” plus a margin would have to be established as a starting point to reflect a producers cost of production and profit. **The most logical base would be the cost of production figures published by the USDA.** In this example, we used the average cost of production of \$24.66 for 23 states that the USDA calculated for November 2009. These states are CA, FL, GA, ID, IL, IN, IA, KY, ME, MI, MN, MO, NM, NY, OH, OR, PA, TN, TX, VT, VA, WA, and mighty WI. We will use a humble 10% net margin. So, the base plus the margin plus the percentage change in the DPI equals the dairyman’s paycheck. The following is a hypothetical illustration for the month of November 2009:

First month:

Base	+	10% Margin	=	Sub Total	+	% DPI Change	=	Pay per CWT
\$24.66	+	\$2.47	=	\$27.13	+	-0.7%	=	\$26.94

The DPI fell 0.7% during November 2009 which shaved \$0.19 per cwt from the Dairyman’s pay. Beginning with the second month and thereafter, we would simply use the previous months pay per cwt plus the percentage change in the DPI to arrive at the new cwt pay. Accordingly, the pricing mechanism is cumulative which by definition makes it less volatile than an entirely new calculation each month.

### Supply and demand would be more in balance

If producers manufacture too much milk the processors and/or retailers could lower their prices to lighten inventories which would lower the dairyman’s income (with a lag). In contrast, if producers manufacture too little milk the processors and/or retailers could increase their prices which would raise the dairyman’s income. If milk product is exported then that is supply taken out of the market. If milk product that was previously exported returns to the domestic U.S. market, then prices would likely be under pressure. **In addition to balancing supply and demand, this pricing mechanism would more closely align the economic fate of the farmer to the processor and retailer.** In the current system, the processor and retailer most often have a positive margin while the producer may not.

### Not a cost of production guarantee

Although initially some or all of the producers cost of production is guaranteed, like any other entity that operates in a competitive environment, the dairymen’s paycheck is tied to the price of dairy products while his/her cost of production is comprised of much different costs including fuel, fertilizer, feed, labor etc. In the long run, the lowest cost or highest value added producers would be rewarded.

**Figure x** shows the monthly U.S. Advanced Class I price from University of Wisconsin professor Brian W. Gould’s web site compared to the DPI Milk Price from 1999 through November 2009 as an example. To recreate the DPI milk price we simply took the Advanced Class I price for the beginning of February 1999 (\$16.84) and added the percentage change in the DPI (+0.7%) for February 1999 to arrive at the February 1999 DPI milk price of \$16.96. For March 1999 and every month thereafter, we started with the previous months DPI milk price (\$16.96) and added March’s DPI percentage change of -0.5% which results in \$16.87. **The take away points from figure x are; 1) The DPI methodology reduces price volatility significantly.** For example, the DPI milk price standard deviation since 1999 is 1.7 versus 3.12 for the U.S. Advanced Class I price. **2) The DPI methodology puts the price of milk closer to the Dairyman’s production cost.** As shown, the DPI milk price would have been \$20.29 for the month of November 2009 compared to \$12.86 for the U.S. Advanced Class I price. **3) Using the wholesale price of milk in February 1999 and calculating the wholesale price today by using the dairy retail price changes over this time period clearly highlights the margin that the processor and retailer are taking today at the dairyman’s expense.**

Note that the DPI milk price fell every month from December 2008 through August 2009, but a total of drop of only \$2.18. In contrast, the U.S. Advanced I price fell a sizeable \$7.29. This clearly illustrates that the processor/retailer was able to make a sizeable margin while every single dairy in the country suffered losses.

**Figure z** shows the Dairy and Related Products Index of retail prices (left hand scale) versus the U.S. Advanced Class I price (right hand scale). The volatility and the too low of a price for the U.S. Advanced Class I price stands out light a sore thumb.

### **Component Pricing and Somatic Cell Count**

Component pricing would still exist. The butterfat and protein price would be 9% and 18% of the DPI milk price, respectively. Butterfat and protein have averaged 9% and 18% of the Class I price (with relatively little variation) during the peak to trough market over the past two years. Since the DPI milk price was \$20.29 in November 2009, the butterfat price would be \$1.83 cwt and protein at \$3.65 cwt as an illustration. Based on demand, processors could offer an additional premium for butterfat and protein.

The maximum somatic cell count would be 750,000. In 2010, if a dairyman can not produce milk with a SCC less than 750,000 then he/she should do something else. A new 100,000 or less SCC threshold should be established to reward the highest quality milk producers.

### **Producer Stability**

This pricing methodology would create much needed economic stability at the producer level. Given the lower level of volatility, there would be less need for the farmer to practice his/her risk management skills on the Chicago Mercantile Exchange. Since many aspects of the dairy business are so very long term (facilities, breeding etc.) and because it is arguably the riskiest business on the earth (animals and weather), producer price stability is critical in my mind.

### **The Milk Processors**

Since this methodology is more of a market based one, processors would be forced to make products that the public wants rather than manufacturing stuff that they can sell to the government at support prices. Dairy product innovation would be driven by consumer demand. Simply put, the purchase of butter and cheese at support prices by the government would no longer be an option. Processors and retailers would be rewarded by the market to develop new uses of milk.

### **Some supply management characteristics**

Although the milk processors would only be lightly regulated, some regulation would be necessary. For example, **1) the processor would be required to continue to buy the producers milk at the calculated price.** However, any increase/decrease in production (outside some variance) by the producer would need to be negotiated with the processor. Thus, the processor would not be required to take on more milk if the dairyman wants to expand. In any case, the dairyman and processor would need to work together to implement more efficient and innovative ideas.

Every dairy farm in the country would be allocated "**Dairy Shares**" which gives that farm the right to sell a certain quantity of milk (current production) at the price. Dairy shares would not be salable and only transferable to another person with the farm. So, as long as the dairy is operating, the processor is obligated to purchase the milk from that dairy at the calculated price. If the father turns the dairy over to the son or if the dairy is sold as a dairy, the processor is still under obligation. However, if the dairy is shut down, turned into a beef farm or sold off to a housing developer than the "Dairy Shares" become valueless and the processor is no longer obligated to purchase the milk. Effectively, supply would leave the market.

**2) an insurance fund would need to be established in order to buy the producers milk in the event a processor shuts down or goes out of business.** This would operate like the Federal Deposit Insurance Corporation (FDIC) in the banking industry where the banks are charged fees that go to the FDIC fund to pay for deposits at failed banks. Similarly, all the milk processors would pitch into a fund to bail out their failed counterpart processors so that the dairyman is made whole.

The only exception to this rule would be small processors, including on farm processors. A small processor could be defined as three million pounds per year or less. **3) these small processors would be exempt (their option) from paying into the insurance fund** which would help them to be more cost effective relative to their larger counterparts. One aim of this regulation would be to allow for more competition on the processor side. The lop sided industry structure in dairy is a key issue in my mind, i.e., there are thousands of producers and only a handful of processors. Allowing for the growth of small/specialty/organic and on farm milk processing would be healthy for the entire dairy industry. From the producer stand point however, since the small processors may choose to not pay into the insurance fund, the market for the producers milk would not be safeguarded.

#### **Dairy check off program**

If the dairy check off program is to continue, funding would be shared by the processor, retailer and producer since it is in all their interests. In fact, any US importer of milk components would also share in funding the check off since it is in their interest too.

#### **Cost effective from a regulatory perspective**

This pricing methodology could be implemented with just a handful of government staff unlike the current system where many people are involved and the cost on an annual basis must be enormous. **What is the USDA cost of regulating milk on an annual basis?**

#### **Beginning Milk Producer**

The only barrier of entry for a new dairy would simply be that a market for the milk be established. That is, the local processor would not be required to automatically buy the new dairy's milk.

#### **The Cooperatives Role**

In this system, the cooperative would no longer be needed by the dairy producer. Based on my observations, the cooperative system does not work. They appear to work together more than they compete and are another expense layer in the system. However, the cooperatives could be hired by the processors to facilitate the collection of milk from the producers since the processors would be responsible/liable for the milk starting from the dairyman's tank, i.e., the processor pays for trucking. **If the processor pays for moving the milk, given their management expertise, there is no doubt in my mind that it would be done more efficiently than today, benefiting the consumer.**

#### **State Regulation**

All state dairy regulation (such as Pennsylvania Milk Marketing Board) would be eliminated. In many areas of Pennsylvania, the producer can only partially or not at all benefit from the Pennsylvania Milk Marketing Board premium. In addition, in my area, some folks drive 5 miles to Kinsman, Ohio to purchase a gallon of milk which is currently \$1.00 less than in the nearby Pennsylvania towns. What is the PMMB accomplishing?

#### **Imports/Exports**

Free trade is good. Pricing would be captured in consumer prices. If milk that is currently exported overseas comes back into the domestic market, domestic prices would go down and vice versa. As written above, U.S. importers of dairy components would be required to contribute to the Dairy Check Off program.

### **Class I, II & III Milk**

The dairy farmer produces milk and expects to be paid the highest market price for fluid milk. Or said another way, if a timber company makes a bid on 100 trees the bid reflects the highest value use for the timber - fancy kitchen cabinets rather than pallets, for example. The dairy farmer produces milk and the processor can do whatever they want with it. Having a Class I, II & III and the utilization fluff is ridiculous. There should be only one DPI milk price.

Presumably if class I milk is used to make non class I products, the cost of production would go up. Leave the cost of production go up and pass it on to the consumer. According to Amber Waves, the average U.S. consumer spends only about 9.8% of their personal disposable income on food down from 13.8% in 1970. This is among the lowest on the planet. **Why in the world should the dairy farmer subsidize the U.S. consumer?**

### **Federal Milk Marketing Order (FMMO) system**

Only oversight functions would still be necessary.

### **National Agricultural Statistical Service**

Their product price survey would not be needed.

### **CME Block Cheese Pricing**

No longer used in milk price calculation.

### **Make allowance**

Not applicable.

### **All other ineffective regulation**

Gone.

### **Key points**

1. The current milk regulatory framework should be extensively restructured, not just minor superficial adjustments like all the proposals I've seen including the proposed legislation.
2. The Dairy Price Index (DPI) methodology would better balance supply and demand, is simple and transparent, would be cost effective from a regulatory perspective and would boost dairy product innovation.
3. Not only would the DPI methodology more closely align the economic fate of the dairy farmer to the processor and retailer but it would also provide much needed financial stability.
4. The volatility of the DPI methodology is almost twice as low as the U.S. Advanced Class I price series.
5. The DPI methodology is simple and transparent.
6. There needs to be more competition on the processing side of the business.
7. Every dairy farm in the country would be allocated "Dairy Shares" which would give that farm the right to sell a certain quantity of milk at the price.
8. Since there is little competition amongst the processors in many areas (like Western PA), some supply management regulation needs to be put in place such as; a dairy's current processor would be obligated to purchase a certain quantity of the farmers milk at the price. An insurance fund similar to that of the FDIC would need to be established in order to make sure the dairyman is made whole on his milk.
9. There needs to be free trade with the rest of world - the U.S. needs to be competitive.

10. The dairyman should not subsidize the consumer by being paid a class III price for fluid milk. What is worse yet, probably 99% of the U.S. population has no idea that they are purchasing subsidized dairy products.

**The author:** I have been the sole owner and operator of the Big House Dairy in Jamestown, PA since February 2008 - grade and registered holsteins. Prior to starting the dairy, I worked for a major investment bank in New York City for 20 years where I held various positions in the investment grade and high yield debt departments. My last role was Vice President of Credit Strategy. I have a B.S. degree in International Finance from Slippery Rock University and an M.B.A. from Pace University in NYC. These ideas are a reflection of my experiences over the past two years at the dairy as well as 20 years in the financial markets.