Testimony of
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Administrative Hearing to Modify the Class I and II Price Formula

My name is Brian W. Gould. I am an Associate Professor in the Department of Agricultural and Applied Economics at the University of Wisconsin-Madison, a position that I have held since 2005. Prior to my faculty appointment, I was an economist with the Wisconsin Center for Dairy Research at the University of Wisconsin since 1988. In both my current and previous positions, I have been extensively involved with analysis of U.S. dairy markets and have published a number of technical papers concerning various aspects of Federal Order milk pricing, the marketing of dairy products, risk management within the dairy industry and the structure of international dairy product demand. A copy of my vitae is attached to this prepared testimony.

A Static Analysis of the Impacts of the Proposed Class I and II Price Changes

The disparate regional impact on producers resulting from the changes in Federal Order Class I and Class II pricing proposed by the National Milk Producers Federation (NMPF) is a major concern. To assess that disparity, my University of Wisconsin colleagues and I have conducted a static analysis of the impacts of the proposed changes. A dynamic analysis, which could have incorporated demand and supply response impacts of the proposed changes, would be preferable but was not possible given the short hearing notice.

In the *Basis for Emergency Consideration* section of the NMPF proposal, the implied justification for making changes to the Class I and II formulas is to offset some of the negative impacts of the Tentative Final Decision (TFD) of the make allowances associated with the determination of Class III and Class IV prices. As NMPF states in its application:

> "An expedited hearing and decision are necessary to provide a more complete consideration of the Class I and Class II price formulas. NMPF expects this fuller consideration will produce offsetting compensation in these formulas, and thereby avoid unnecessary and excessive reductions in producer income."[1]

The question is whether the proposed Class I and II formulas would achieve the desired offset. To help answer this question we simulated the effects on producer revenue of imposing both the proposed changes in Class I and II pricing formulas and the Class III and IV make allowances identified in the recent TFD. We conducted the simulations for three Federal Orders representing the full range of class utilizations: the Northeast Order (FO 1), the Florida Order (FO 6) and the Upper Midwest Order (FO 30). The following table provides the average class utilization rates observed for these orders during 2006.

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[1] NMPF, 2006. Request for Emergency Hearing to Amend Marketing Orders, p 5.

Exhibit 26
Witness
Date Rptr.
Powers Garrison & Hughes

The Florida Order typically has the highest Class I utilization and lowest Class III utilization among Federal Orders. The Upper Midwest Order typically has the lowest Class I utilization and highest Class III utilization.

Table 1: Utilization of Producer Milk by Class
Jan-Oct 2006

Federal Order	*Class Utilization, Percent*			
	I	*II*	*III*	*IV*
Northeast	45.9	20.0	22.4	11.8
Upper Midwest	16.9	5.5	75.0	2.6
Florida	83.7	7.8	3.5	5.0
All Market Ave.	37.2	12.6	39.4	10.8

Source: Dairy Programs, AMS, USDA, various Market Bulletins.

For each of the three separate Federal Order markets, we used monthly data for the April 2003-October 2006 period relating to: (1) monthly producer milk class utilization rates, (2) producer deliveries, (3) Class I skim mover and butterfat advanced values, (4) Class I differentials, (5) announced FMMO Class II-IV prices, (6) two-week NASS average Butter, NFDM, Cheese and Dry Whey prices, and (7) monthly NASS butter prices.

We calculated weighted average order prices (weights are utilization rates by class) under current Federal Order pricing formulas.[2] We then incorporated the NMPF proposed changes in Class I and II pricing formulas as well as the TFD Class III and IV make allowance changes.[3] After incorporating both proposed changes in order pricing formulas, we simulated order prices for each class and recalculate the weighted average price. Simulated values were compared with those actually observed over the April 2003 – Oct 2006 period.

It should again be emphasized that this is a static analysis, comparing actual prices with what would have resulted from the proposed changes in pricing formulas. The analysis does not account for any supply or demand adjustments that would result from differential class price changes. It has long been recognized that increasing Class I differentials has the indirect effect of decreasing the price of manufacturing milk. For example, Buxton (1979) states:

> "Increasing Class I differentials encourages milk production, as described above. It also discourages fluid milk consumption by increasing fluid milk prices. The combined impact is to increase the amount of milk that must be used to make additional manufactured products to be sold in the manufactured dairy product

[2] The calculated weighted average prices are not identical to announced order uniform prices because of various pool deductions and other factors, but they are reasonably close. The use of weighted average prices was necessary in order to compare "apples to apples," since uniform prices under the revised formulas cannot be calculated.
[3] The make allowance changes specified in the TFD reduce the Class III and IV prices by $0.25 and $0.17/cwt respectively.

market. These additional manufactured dairy products tend to depress the manufacturing milk market."[4]

In more recent analyses, Blayney and Normile (2004), Price (2004) and Miller and Blayney (2006) reach similar conclusions.[5]

Reduced fluid consumption combined with increased producer deliveries would disproportionately increase the volume of milk for manufacturing milk, cutting Class III and IV prices more than suggested by the make allowance changes specified in the TFD. These effects would differ across Federal Oder. We did not attempt to measure these changes.

Figures 1-3 illustrate the price effects of the proposed formula changes over the April 2003-October 2006. The price effects are measured as the simulated weighted average price with the TFD and NMPF formula changes minus the current weighted average price. Since the NMPF Class I/II proposal would affect MILC payments as well as minimum order prices, we compared results with and without the MILC payment reduction. The results which incorporate the MILC payment reductions pertain only to milk that is eligible for MILC payments.

These three figures emphasize the different regional impacts that would result from the proposed Class I and II changes. The highest positive net effect (without considering MILC payment impacts) is Florida which has the highest Class I utilization. Negative impacts are shown for the Upper Midwest in those months when there was no depooling. The influence of Class I utilization rates on producer revenues is clearly illustrated in the charts for the Upper Midwest Order — large net gains were obtained during those months with abnormally high Class I utilization rates resulting from significant de-pooling.

The 73 cents/cwt. increase in the Boston Class I price resulting from the NMPF proposal would have yielded lower MILC payments. The lower panel in each of the figures shows the net price impacts after deducting the reduction in MILC payments. After accounting for the MILC impacts there is a shifting down of all of the profiles for those months in which MILC payments occurred.[6] For the Upper Midwest, consistently negative net price impacts were obtained from May '05 – October '06.

Table 2 is used to summarize the information in the charts for the abbreviated period January - October 2006. There was no de-pooling during this recent time period, so the

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[4] Buxton, B. 1979. *Milk Marketing Order Regulations*, Staff Paper P79-14, Department of Agricultural and Applied Economics, University of Minnesota, May.

[5] Blayney, D. and M. Normile, 2004, *Economic Effects of U.S. Dairy Policy and Alternative Approaches to Milk Pricing*, Report to Congress, Economic Research Service, USDA, July.

Price, J., 2004. *Effects of U.S. Dairy Policies on Markets for Milk and Dairy Products, Economic Research Service*, Technical Bulletin #1910, May.

Miller, J.J, and D.P. Blayney, 2006. Dairy Backgrounder, Report LDP-M-145-01, World Agricultural Outlook Board, U.S. Department of Agriculture,

[6] There were no MILC payments for the months of September '03 – December '03, May '04 – May '05, and July '05 – November '05.

milk utilization rates can be considered as reflecting more traditional delivery patterns. In addition to the impacts on the weighted average class price, we provide an estimate of revenue impacts, calculated by multiplying the change in average price by producer deliveries.

Total Order-wide revenue effects are calculated without and with MILC payment reductions. The effect including MILC requires an estimate of the volume of milk eligible for payment given the 2.4 million pounds per farm MILC production cap. Milk eligible for full milk payments was calculated for selected states by using NASS herd size distribution and milk production data for 2005. Critical herd size was defined as 2.4 million pounds divided by the average milk per cow for each state, and ranged from 105 cows (Arizona) to 186 cows (Kentucky). Herds smaller than the critical size were assumed to receive payment on total milk production, calculated as the state average milk per cow times the midpoint of the relevant NASS herd size category. Herds larger than the critical size were assumed to receive payment on 2.4 million pounds of milk. A uniform distribution of herds was assumed within the "break" category (100-199 cows). Using this methodology, the percentages of milk eligible for payment were estimated to be: Florida – 18.6; Northeast – 64.0; Upper Midwest – 76.1.

Table 2: Summary of Estimated Average Monthly Effect of TFD and NMPF Class I/II Proposal, Jan.– Oct. 2006

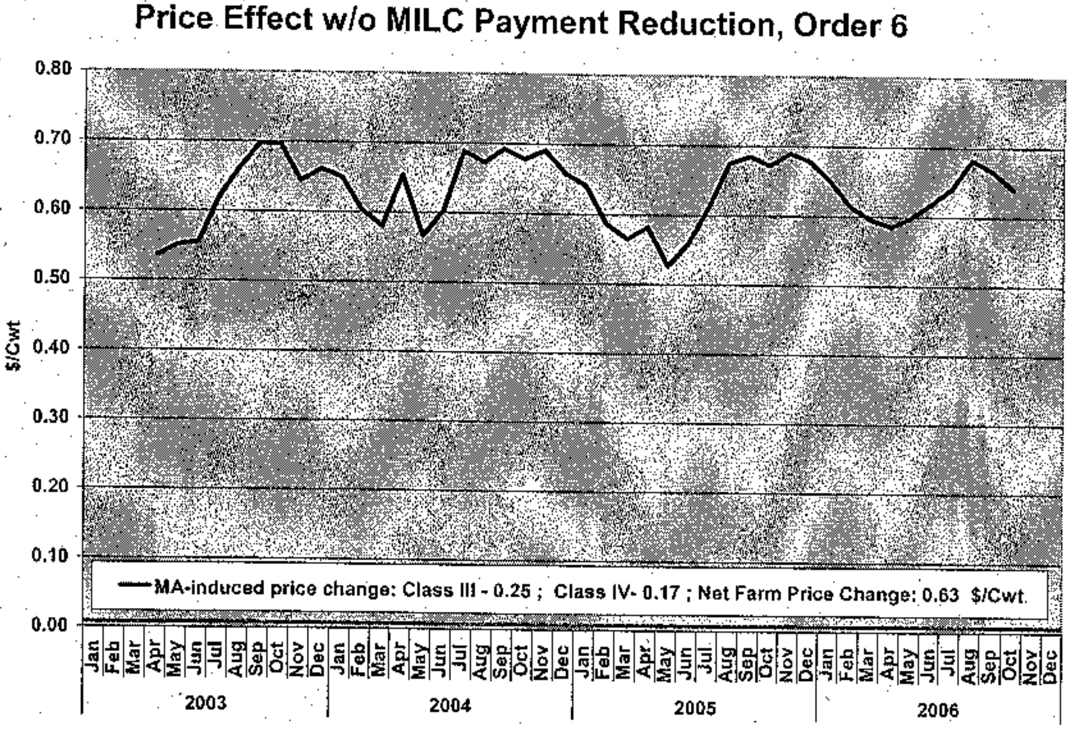
	Federal Order		
	Florida	***Northeast***	***Upper MW***
Weighted Average FO Price ($/Cwt.):			
Actual	15.05	13.09	11.94
With TFD and Class I/II Proposal	15.68	13.38	11.88
Price Effect ($/Cwt.= With Change - Actual)	0.63	0.29	(0.06)
Market Revenue Effect ($Mil./month)	1.64	5.50	(1.32)
MILC Payment Reduction ($Mil./month)	(0.11)	(2.31)	(3.90)
Combined Revenue Effect:			
Net ($Mil./month=Market Revenue+MILC Reduction)	1.53	2.69	(5.22)
Percent of Actual 2006 Marketing Value	3.9	1.08	(1.97)

Given the static nature of this analysis, it can be considered a conservative estimate of the impacts the proposed federal order pricing changes. As indicated by the preliminary USDA analysis with respect to the impact on total Federal Order marketings, higher Class I milk prices will generate a positive supply response. This increase needs to be considered along with the anticipated decrease in the demand for Class I and II products as a result of higher retail prices for these products. An increased supply of milk and combined with decreased demand for Class I and II products means increased volumes of milk to Class III and IV uses. More cheese and NFDM will result in lower commodity prices and lower Class III and IV prices.

The anticipated decrease in Class III and IV prices resulting from the NMPF proposal will negatively impact orders with relatively high Class III and IV utilization rates in another way should the MILC program be extended beyond its August 2007 sunset. In Table 2 and associated Figures we illustrated the negative impacts of lower MILC payments due to higher simulated Class I prices. These lower payments then need to be coupled with lower Class III and IV prices. This implies that for producers in markets with high Class III and IV utilizations, producers will experience:

- Lower market induced Class III and IV prices; and
- With a higher Class I mover, the difference between the Boston $16.94 Class I price and the mover is reduced which means smaller MILC payments in times of "depressed" milk prices.

Figure 1: Simulated Impacts of TFD and NMPF Proposal on the Florida Order (FO 6)



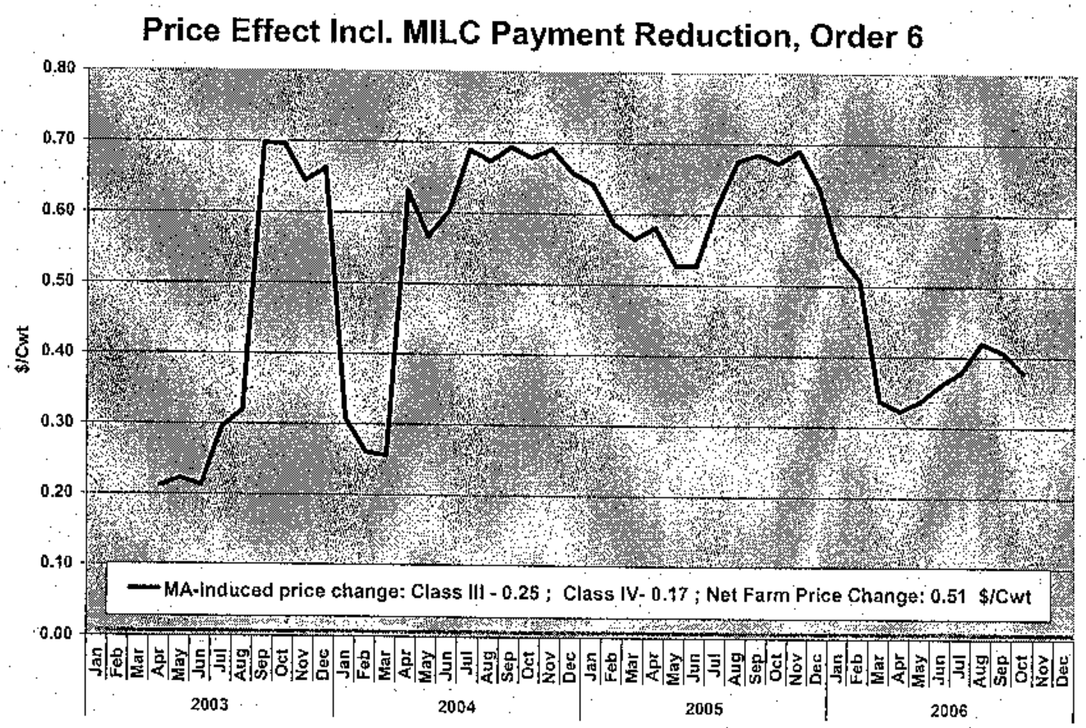
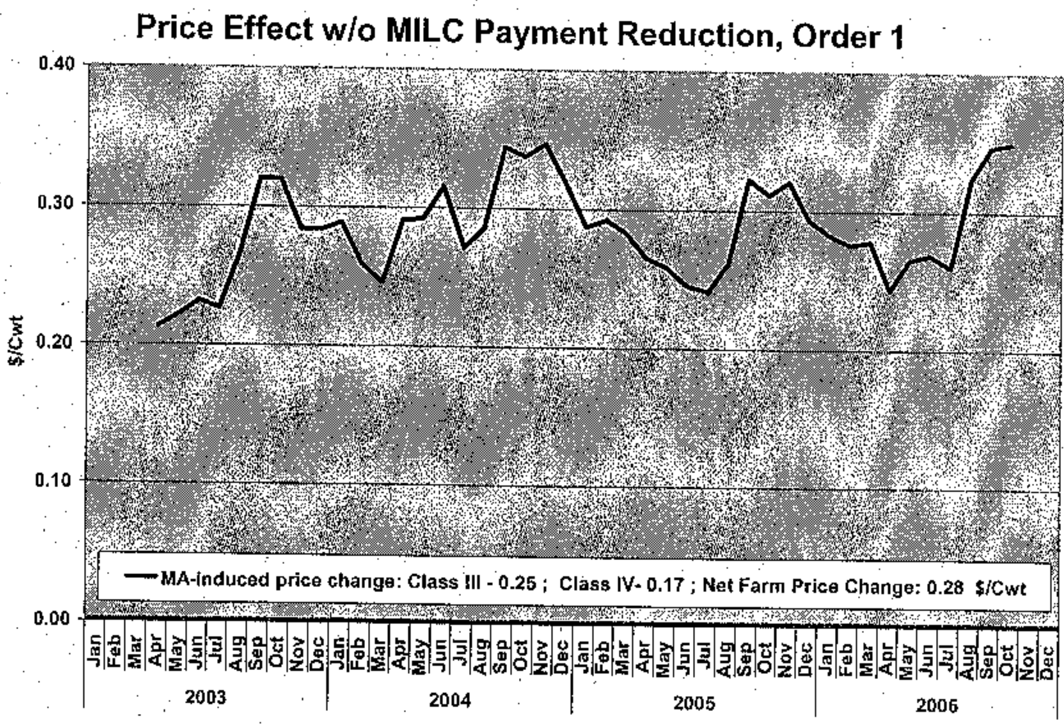


Figure 2: Simulated Impacts of TFD and NMPF Proposal on the Northeast Order (FO 1)



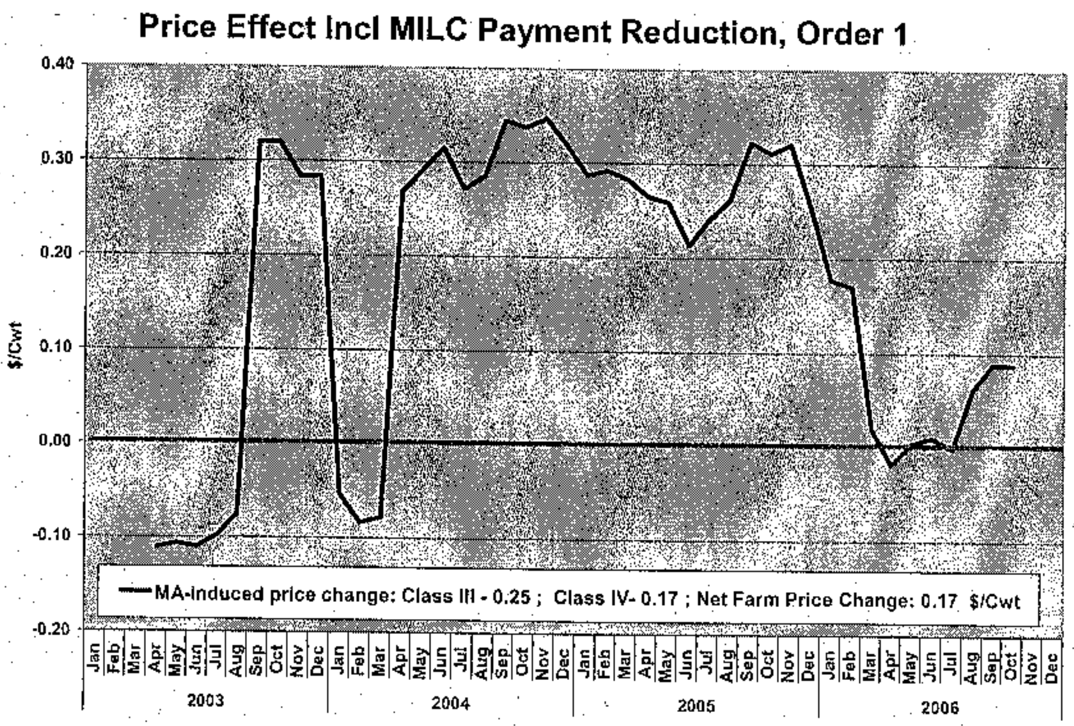
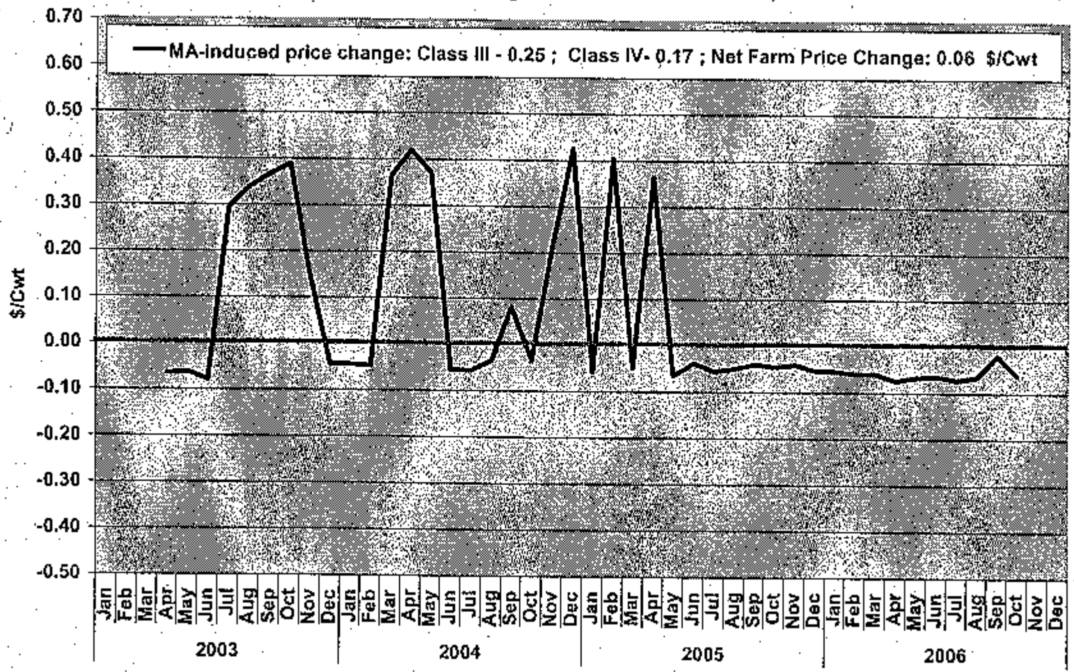
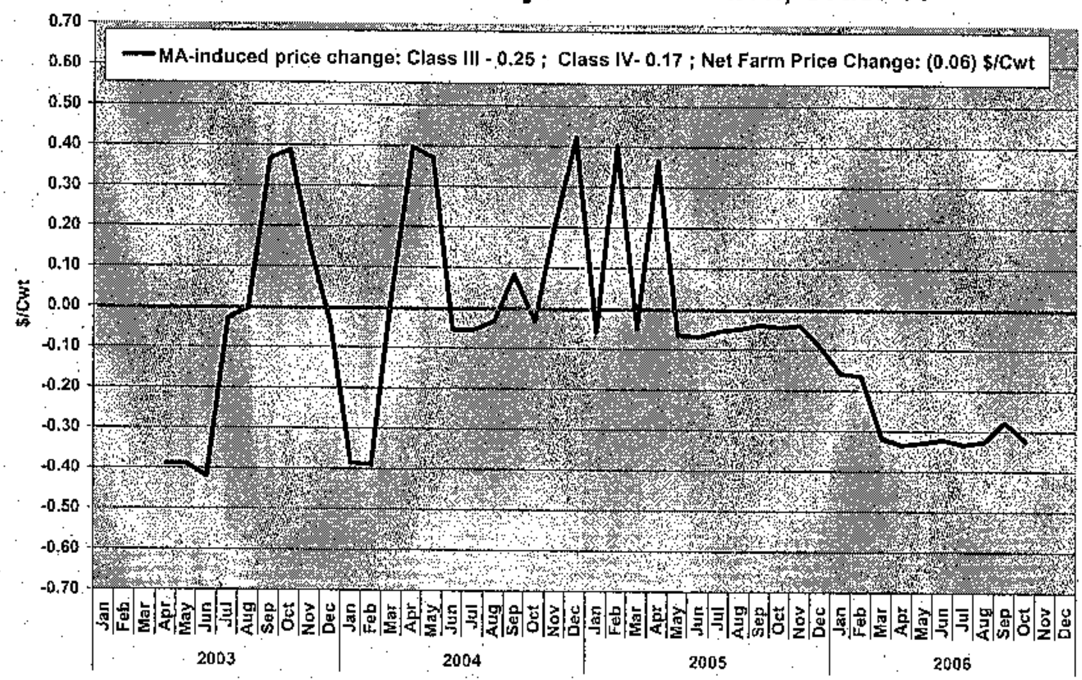


Figure 3: Simulated Impacts of TFD and NMPF Proposal on the Upper Midwest Order (FO 30)*

Price Effect w/o MILC Payment Reduction, Order 30



Price Effect Incl. MILC Payment Reduction, Order 30



*Significant depooling and related abnormally high Class I utilization occurred in the Upper Midwest order in several months during 2003-2003

Statistical Concerns with USDA's Economic Analysis of the NMPF Proposal

The USDA simulations of the effects of the NMPF proposal provide an initial estimate of the impacts on both Class prices and marketings. The results obtained by USDA demonstrate that increased total marketings and decreased Class III and IV prices would result from adoption of the NMPF proposal. It is our opinion that these simulated values represent very conservative estimates of the impacts.

The model structure used by USDA to simulate the milk supply response to the NMPF is achieved by separate responses of cow numbers and milk yield by a change in the All-Milk price. The functional form used in the estimation of the determinants of cow numbers is log-linear which implies that the resulting elasticity estimates with respect to a particular explanatory variable equals the estimated coefficient. This, in turn implies that the resulting elasticity estimate is constant and does not change with changes in the all-milk price, current herd size, etc. Using USDA's estimated 9-year average change in total marketings of producer milk and the change in the All-Milk price resulting from the full NMPF proposal yields an estimated "arc elasticity" of 0.027.

I have two comments concerning this supply elasticity.[7] Given the constancy of the cow number elasticity, a majority (> 92%) of the related supply impact comes from the change in cow numbers since the USDA "cow number" elasticity is reported at 0.025 in the documentation of USDA's National Econometric Model.

The model documentation further indicates that there is a significant amount of variability in the estimated cow number elasticity, reporting a t-ratio of 1.24 associated with the estimate.[8] Using the implied elasticity standard error, Table 3 provides the range of elasticity values at selected confidence intervals. Note that at the 95 percent confidence level, the lower bound of the estimate is negative. Given the low precision of the estimate for this major determinant of the overall estimate of milk supply response, using a range of elasticity values instead of a point estimate would be preferable. The question that needs to be asked is what would be the effects of the NMPF proposal if the actual cow number elasticity is at the extremes of the various confidence intervals.

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[7] A supply elasticity is typically defined as the percentage change in quantity produced resulting from a percentage change in the price for the commodity being produced. Supply elasticities are often estimated as either short-run or long-run. In the short-run, a dairy producer will respond only marginally to a change in milk price whereas in the long-run many other things, such as herd size, milking system, land base, etc. can change. Suppose one estimated a short-run farm-milk supply elasticity of 0.10 and a long-run elasticity of 0.35. These values imply that if the milk price changes by 10 percent the milk supply would be expected to change by 1 percent ($0.1*0.1 = 0.01$) in the short-run and by 3.5 percent in the long-run run.

[8] A "t-ratio" is the ratio of the estimated regression coefficient and its associated standard error. The cow-number elasticity standard error is 0.0202.

Table 3. Confidence Intervals for USDA Cow Number Supply Elasticity		
Level of Confidence (%)	*Elasticity Value*	
	Lower Bound	*Upper Bound*
66.0	0.016	0.034
80.0	0.008	0.042
95.0	-0.008	0.058

Note: An interpretation of these confidence intervals is as follows: Given the estimated elasticity and associated standard error, there is an 80% probability that the true but unknown cow number elasticity falls between the values of 0.008 and 0.042.

My second comment on the supply elasticity concerns the very low production response to price implied by the USDA value. Even the upper bound of the 95% confidence interval value of 0.058 is considerably smaller than published medium/long-run supply elasticity estimates. Some of these estimates are shown in Table 4. The USDA 9 year average supply elasticity of 0.027 is only 12% of the smallest elasticity point estimate shown in Table 4 (0.224).

Given the magnitude of the difference between the USDA supply elasticity value and other estimates, a sensitivity analysis should have been conducted to examine the impacts of larger elasticity values. Using larger supply elasticities would have generated correspondingly larger supply increases in response to the NMPF proposal, resulting in larger negative impacts on Class III and Class IV prices.

Table 4. Previously Published Milk Supply Elasticities Compared to Value Used in USDA Analysis of NMPF Proposal	
Authors	*Supply Elasticity Estimate*
USDA (2006)	***0.027***
Cox and Chavas (2001)	0.370
Susuki, Kaiser and Lenz (1995)	0.224
Helmberger and Chen (1994)	0.583
Adelaja (1991)	0.513
Chavas and Klemme (1986)	0.695
Levins (1982)	1.165
Ippolito and Masson (1978)	0.650

Source of Milk Supply Elasticity Estimates:

USDA, USDA Agricultural Marketing Service Dairy Programs, *National Econometric Model Documentation*, Office of Chief Economist, Dairy Programs, October 2006 (Note: The value displayed is derived from the ratio of the 9-yr average percent change in total milk marketings from the baseline resulting from the combined I and II changes to the 9-yr average percent change in All-Milk Price from the baseline resulting from the combined I and II changes.)

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Ippolito, R.A., and R.T. Masson, *The Social Cost of Government Regulation of Milk*, Journal of Law and Economics, 21: 33-65.

Summary

There is no doubt that costs for both dairy farmers and dairy plants have increased since Federal Order pricing formulas were last changed in April 2003. These increases have come about as a result of increased input costs, primarily energy-related. All dairy farmers have seen their costs escalate; the cost increase is not related to Class I utilization. Therefore, it is hard to understand why offsetting price relief should be offered proportional to Class I use. This is precisely what the NMPF proposal does.

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ACADEMIC BACKGROUND
Ph.D - Agricultural Economics, Cornell University, Jan. 1983.
M.S. - Agricultural Economics, University of Connecticut, June 1978.
B.A. - Economics, University of Connecticut, May 1976.

POSITIONS HELD

Jan. 2005 - Present	Associate Professor, Department of Agricultural and Applied Economics, University of Wisconsin-Madison
July 1993 - Dec. 2004	Senior Research Scientist, Wisconsin Center for Dairy Research and Department of Agricultural and Applied Economics, University of Wisconsin-Madison
Dec. 1988 - June 1993	Associate Research Scientist, Wisconsin Center for Dairy Research and Department of Agricultural and Applied Economics, University of Wisconsin-Madison
Dec. 1986 - Nov. 1988	Assistant Research Scientist, Department of Agricultural and Applied Economics, University of Wisconsin-Madison
Nov. 1982 - June, 1987	Assistant Professor, Department of Agricultural Economics, University of Saskatchewan, Saskatoon, Saskatchewan
Jan. 1, 1983 - Oct. 31, 1982	Research Associate, Department of Consumer Economics and Housing, Cornell University, Ithaca, New York
Sept. 1, 1978 - Dec. 31, 1981	Research Assistant, Dept. of Agricultural Economics Cornell University, Ithaca, New York
May 1, 1979 - Sept. 1, 1979	Research Intern, Solar Energy Research Institute, Golden, Colorado

RESEARCH INTERESTS
Food Demand and Nutrition, Agricultural Policy Analysis, Dairy Marketing, Dairy Price Risk Management

RECENT REFEREED PUBLICATIONS
B.W. Gould and H. Villarreal, 2006. An Assessment of the Current Structure of Food Demand in Urban China, *Agricultural Economics*,34:1-16.
Chung, C., D. Dong, T. Schmit, H. Kaiser, and B.W. Gould, 2005, Estimation of Price Elasticities from Cross-Sectional Data, Agribusiness, 21(4):1_20.

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EXTENSION/OUTREACH

Dairy Marketing Website (Overview)

The University of Wisconsin Dairy Marketing web site (http://www.aae.wisc.edu/future) provides a central location for dairy marketing data, outlook, education materials, software, research and links to related sites. This is one of the primary systems by which the University of Wisconsin Extension Risk Management team makes available educational material related to price risk management for the dairy industry. The website is divided into 7 major sections, Risk Management Curriculum, Data Archive, Current Outlook, Publication Archive, Software Archive, Current Industry Information and Links to other Dairy-Related Sites. Software systems have been developed whereby daily analyses of dairy market trends are graphically generated to insure the availability of timely information.

Risk Management Curriculum Development

As an active participant in the University of Wisconsin-Extension Risk Management team I assisted in the development of a series of on-line materials to assist educators (i.e., extension agents) design their own risk management curriculum. This material can be obtained from the following location: http://www.aae.wisc.edu/future/risk_team/risk_team_1.htm . A second example of the type of outreach/education efforts undertaken include an online tutorial system that can be used by dairy farmers and processing firms to better understand how to use dairy-based futures and options (e.g., Class III) to control output and input price risk. This software system consists of interactive web pages which the user runs on a local computer (after installation) and fills in a series of responses to questions concerning the use of specific futures and options strategies. These strategies range from the very simple such as the use of put/calls and hedging to more advanced strategies such as cash contract/call purchase, short fence, etc. This tutorial system can be found at: http://www.aae.wisc.edu/future/front_software.htm .

Information Systems for the Analysis of Current and Proposed U.S. Dairy Policy

A variety of software tools have been developed to assist dairy farm operators, processors and policy makers understand the implications of changes to current U.S. dairy policy. This material is made available to all participants in the dairy industry via the University of Wisconsin Dairy Marketing web site. An example of these systems can be obtained from the analysis of the Milk Income Loss Contract (MILC) program (http://www.aae.wisc.edu/future/milc.htm) The various spreadsheet-based models associated with this analysis were designed to be used by dairy farm operators to quantify farm level impacts of program participation decisions.

Development of Information Systems for the Dairy Processing Industry

Specialized software systems have been developed to assist the Wisconsin and national dairy processing sectors. One examples of these systems include the EACY© (*Economic Analysis of Cheese Yield*) software package. This is a Windows-based software package used by cheese manufacturers to analyze the impacts of alternative milk compositions and standardization procedures on milk yield, returns, amount of whey-based products produced. Overall net returns are calculated. This software is made available to the cheese manufacturing sector for a modest fee and has been distributed nationwide.

DAIRY-RELATED DEPARTMENTAL PUBLICATIONS

Jesse, E., B.W. Gould and B. Cropp, 2006. Price-Protecting Butterfat in High-Testing Herds: Using the CME Deliverable Butter Contract, *Marketing and Policy Briefing Paper No. 91*, Department of Agricultural and Applied Economics, University of Wisconsin-Madison, August.

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B. W. Gould and J. Kim, 1998. The Structure of Meat, Poultry and Dairy Product Demand in the Former Soviet Union, _Babcock Institute Discussion Paper No. 1998-3_, The Babcock Institute for International Dairy Research and Development, University of Wisconsin-Madison.

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B.W. Gould, 1997. _Use of Dairy-Based Futures Contracts_, UW Dairy Pipeline, Wisconsin Center for Dairy Research.

B.W. Gould and Kurt A. Carlson, 1997. _Results from the 1996 Wisconsin Cheese Plant Manager Survey_, final report,Wisconsin Milk Marketing Board, February.

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