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**Implications of Seasonal Milk Production in New York
and Seasonal Price Incentive Plans**

by

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Preface

Harry M. Kaiser is an assistant professor in the Department of Agricultural Economics, Cornell University. The author acknowledges useful comments and suggestions from Katherine Beissner, and the assistance of Mary Jo DuBrava and Lillian Thomas in preparing this paper.

This paper was submitted as testimony for the hearings on the proposed amendments to the New York-New Jersey and New England Federal milk marketing orders. Dr. Kaiser's testimony concerns an amendment which proposes replacing the current Louisville seasonal price incentive plan with a Base-Excess program. While fundamentally different, both programs are designed to lessen milk production seasonality by providing financial incentives and disincentives for less production in the spring and more production in the fall. His testimony is based on recent research with respect to the ramifications of milk production seasonality in New York State and policies designed to mitigate this problem. The interested reader is referred to the following publications which summarize the results of this research in greater detail:

Kaiser, Harry M., Pascal A. Oltenacu, and Terry R. Smith,. "The Effects of Alternative Seasonal Price Differentials on Milk Production in New York." **Northeastern Journal of Agricultural and Resource Economics**, Vol. 17, No.1, pp. 46-55, April 1988.

Oltenacu, Pascal A., Terry R. Smith, and Harry M. Kaiser. "Factors Associated With Seasonality of Milk Production in New York State." **Journal of Dairy Science**, Forthcoming.

Putnam, James N. II, Sidney E. Barnard, Harry M. Kaiser, and Fred C. Webster. Dairy Marketing in the Northeast: Summary Version. Published by the **Springfield and Baltimore Farm Credit Banks**, October 1987.

Putnam, James N. II, Sidney E. Barnard, Harry M. Kaiser, and Fred C. Webster. Dairy Marketing in the Northeast: Comprehensive Version. Published by the **Springfield and Baltimore Farm Credit Banks**, November 1987.

Implications of Seasonal Milk Production in New York and Seasonal Price Incentive Plans*

My name is Harry M. Kaiser and I am here to testify on Proposal Number 12, which would replace the existing Louisville seasonal price incentive plan in the New York-New Jersey (Federal Order #2) and New England (Federal Order #1) Federal milk marketing orders with a Base-Excess price incentive plan. I am an assistant professor of agricultural economics at Cornell University in Ithaca, New York. I have been in this position since August 1985.

My position at Cornell is split into three categories: 50% of my time is devoted to research, and the remaining 50% is split equally between teaching and extension. The majority of my research (90%) has focused on federal dairy policy issues in New York, the Northeast, and nationwide. The focus of my 25% extension appointment closely parallels my research component, i.e., I work with dairy industry leaders in the public and private sectors on dairy policy issues. I have taught two courses: (1) Ag. Econ. 346 (Dairy Marketing and Policy) and (2) Ag. Econ. 412 (Mathematical Programming). I have authored, or coauthored, 13 journal articles and 64 manuscripts in agricultural economics, as well as given 44 presentations and speeches around the country in my career thus far. By far the majority of this output has centered on dairy policy, including the seasonality issue which I will discuss today. Hence, I think that it is accurate to state that I have devoted a significant portion of my time to studying dairy policy, both in New York (and the Northeast), and nationwide and I have accumulated some expertise on this complicated, but fascinating industry.

Prior to joining Cornell's faculty, I was a graduate student of Agricultural

* This paper is the author's written testimony to the amendment hearings for the New York-New Jersey and New England Federal milk marketing orders. This testimony was submitted into the records on November 15, 1989.

and Applied Economics at the University of Minnesota. At Minnesota I specialized in micro and macroeconomics, agricultural policy, marketing, and production economics. I received a Ph.D. from the University of Minnesota in July 1985. My other educational accreditations include an M.S. in agricultural and applied economics from the University of Minnesota, and a B.A. in economics and history from the University of Wisconsin-Eau Claire.

The issues I will address today concerns the proposed adoption of a Base-Excess plan and elimination of the Louisville plan in Federal Orders #1 and #2. The purpose is to present some results of my research on the impact of milk production seasonality on the Northeast dairy industry, and some of the economic implications of alternative seasonal price incentive plans designed to lessen this seasonality in the Northeast. My remarks will draw from two research projects that I was involved with between 1985 and 1988. The first project was entitled **Dairy Marketing in the Northeast**, a project sponsored by the Farm Credit Banks of Springfield and Baltimore, Cornell University, The Pennsylvania State University, and the University of Vermont. The principal investigators of this project were James Putnam (Farm Credit Banks of Springfield), Dr. Sidney Barnard (The Pennsylvania State University), Dr. Fred Webster (University of Vermont), and myself. One of the issues dealt with in this study was the impact of seasonality on the Northeast's competitive position relative to the national dairy industry. The second project was entitled **Determination of Financial Incentive Plans and Development of Appropriate Farm Management Strategies to Correct Seasonality of Milk Production in New York State**, sponsored by a New York Agriculture and Markets Research Grant. The principal investigators of this project were Dr. Pascal Oltenacu (Cornell University), Dr. Terry R. Smith (Cornell University), and myself. The purpose of this research project was to examined various economic dimensions of milk

production seasonality in New York State.

I want to make it clear at the start that it is not my intention to be an advocate on either side of the issue. I am not representing any organization today; I hope that I am representing the public interest, which I feel is my responsibility as a faculty member at a land grant institution. Thus, I will not state whether or not I feel the proposed amendment should or should not be adopted. Rather, I will discuss some of the economic ramifications of all sides of the issue to help the dairy farmers of these two Federal Orders make an informed decision.

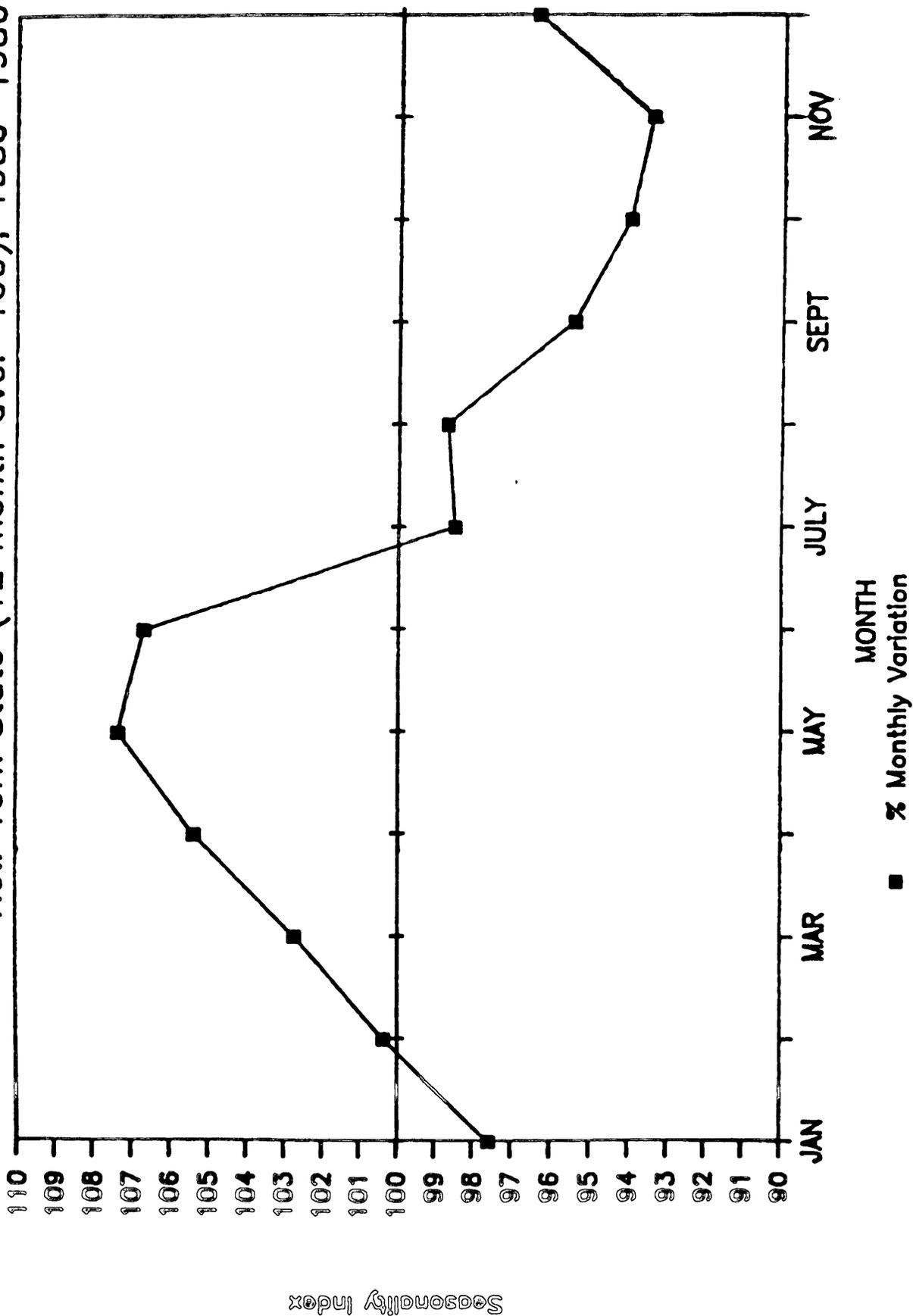
My initial interest and motivation for research on seasonality stems from the fact that seasonality is one of the most important problems currently affecting the future competitiveness of the Northeast dairy industry relative to other regions of the country. I want to begin by elaborating on what seasonality is and why it is a problem to the Northeast.

The term "seasonality" refers to a pattern of milk production characterized by higher levels of production in the spring than in the fall. To illustrate, consider Figure 1 which shows monthly milk production as a percent of annual average monthly milk production for New York State from 1980 to 1986. New York milk production tends to be highest in May, with almost 8% more raw milk being produced than the 12 month average, and lowest in November, with almost 7% less raw milk produced than the 12 month average.

This 15% gap between the lowest and highest production months only partly illustrates the problem of seasonality. In order to see the real extent of the problem, one needs to look at monthly variations in raw milk supplies available after the fluid needs are met, especially for the "hard" Class II products. Since many states in the Northeast have relatively high fluid utilization, and since raw milk usually satisfies fluid needs first, the excess raw milk left over for hard prod-

Figure 1. Variation in Milk Production

New York State (12 month ave.=100), 1980-1986



Seasonally Index

MONTH
■ % Monthly Variation

uct manufacturing is significantly more seasonal. For example, in 1985, daily receipts for the three largest Class II dairy plants in Federal Order 2 were more than 38% higher in May than November. It is clear that seasonality is a far greater problem for Class 2 than Class 1 milk processors.

Why is seasonality a problem? It is a problem because it is responsible for excess capacity in plants and equipment, which are built to run at full capacity during the spring flush, but greatly underutilized during the remainder of the year. This raises processor operating costs and reduces their economic efficiency. A 1982 study by the U.S. Department of Agriculture estimated that seasonality adds an extra \$0.87 to \$1.27 cost per cwt. to processing raw milk (Ling). Most of the extra cost is due to excess plant capacity and inefficiencies in milk hauling. This study was based on a hypothetical cooperative that processed 2 million pounds of raw milk per day into fluid products and 2 million pounds into hard products.

Who are the losers due to seasonality? The inefficiencies due to seasonality hurt dairy processors competing for share in the national Class 2 market. The hard dairy product market is national in scope and very competitive. The Northeast as a region will have to make gains in cost efficiency if they are to maintain their national market share in the future. Seasonality hurts the consumer since the added costs of seasonality are often passed along in the form of higher prices. They hurt the taxpayer since spring surplus milk is purchased by the federal government through the dairy price support program. They hurt the dairy farmer who is a member of a cooperative because cooperatives usually are the within year "balancers" of seasonality. And they hurt the independent dairy farmer because of the price fluctuations it causes. In short, seasonality is everyone's' problem in the Northeast to some extent.

Recognition of this problem is evident by the fact that Federal Orders #1

and #2 have operated a seasonal price incentive plan for some time now to try to mitigate seasonality to some degree. Since 1967, Federal Order #2 has operated a "take-out pay-back" plan (commonly referred to as the Louisville plan) to lessen seasonality. The level of these take-outs and pay-backs were increased only once, in 1971, to adjust for inflation. While seasonality in Federal Order #2 has been reduced since 1967, most industry leaders still feel it is a problem. This fact became clear while working on **Dairy Marketing in the Northeast**, where we interviewed over 200 leaders in the dairy industry.

With the recognition of seasonality as an important challenge to the region's competitiveness, Oltenacu, Smith, and myself posed several questions which we felt were important to research and answer. The questions that I want to answer and discuss today are the following:

- (1) What awareness do farmers have concerning the Louisville plan?
- (2) Do producers respond to economic incentives and disincentives? And if so, how would the degree of seasonality change based on alternative levels of seasonal price differentials?
- (3) What type of dairy farmers are more likely to adjust their seasonality in response to the economic incentives due to within year price differentials?
And
- (4) What type of dairy farmers are less likely to adjust their seasonality in response to the economic incentives due to within year price differentials?

To answer these, and other questions, we conducted a mail survey of some 2,465 randomly selected farmers from New York State in November 1986 through January 1987. From this sample, 1,169 (47.4%) completed or partially completed questionnaires were returned. Statistical tests for how representative this sample was of the state's 12,970 dairy farmers were conducted and the results indicated that the 1,169 dairy farmers were representative of the total

population.

To answer question 1, farmers were asked a question which concerning their awareness of the existence of the Louisville plan in Federal Order #2. Approximately 35% of the 1,169 farmers were unaware that the Louisville plan existed. This figure was not surprising to us because the deduction and premiums in the spring and fall are not reported on farmers' milk checks. While a high degree of unawareness is not surprising, the implications of this are extremely important. If producers are unaware of the Louisville plan, then one should not expect them to change their patterns of seasonality.

The answers to the remaining questions boils down to determining farmers' within year supply response to different levels of price differentials. We estimated this supply response based on a hypothetical seasonal price plan which deducted a certain amount from the milk price in the first six months of the year, and added it back during the second six months of the year. Producers were asked what percent of their annual production would they produce in the first six months and in the second six months of the year for each of four alternative differentials: \$0.00, \$1.00, \$2.00 and \$3.00. These semi-annual responses were then disaggregated to monthly responses by using each farmers actual monthly milk production patterns averaged over 1980-86. All farmers' responses were then aggregated to simulate how the entire state's milk supply seasonality would vary with a seasonal price differential ranging from \$0.00 to \$3.00.

Figure 2 illustrates the simulated relationship between production seasonality, as quantified by the "seasonality coefficient," and alternative price differentials. The seasonality coefficient (SC) measures the percentage difference between spring and fall milk production, e.g., $SC = .10$ means that 10% more milk is produced in the spring than in the fall. Each price differential

Figure 2. Estimated Seasonality Coefficient
by Price Differential, Entire Sample

