



UPPER MIDWEST MARKETING AREA

THE BUTTER MARKET 1987-2000 AND BEYOND

STAFF PAPER 00-01

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July 2000

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## **The Butter Market 1987-2000 and Beyond**

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### **Abstract**

This study investigated the butter market over the period January 1987 through May 2000. Results of this study indicate that:

- The butter market will continue to show a high degree of price volatility reflecting the tight supply/demand situation for butter,
- The butter price represents the supply/demand situation for butterfat used in butter as well as butterfat used in other products,
- Butter production and the butter price are inversely related, that is as the butter price increased, butter production declined,
- Per capita butter consumption and the butter price are inversely related, that is as the butter price increased, per capita consumption declined, and
- Per capita butter consumption and butter production are highly seasonal with production peaking in January and consumption peaking in December.

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## **The Butter Market 1987-1999 and Beyond**

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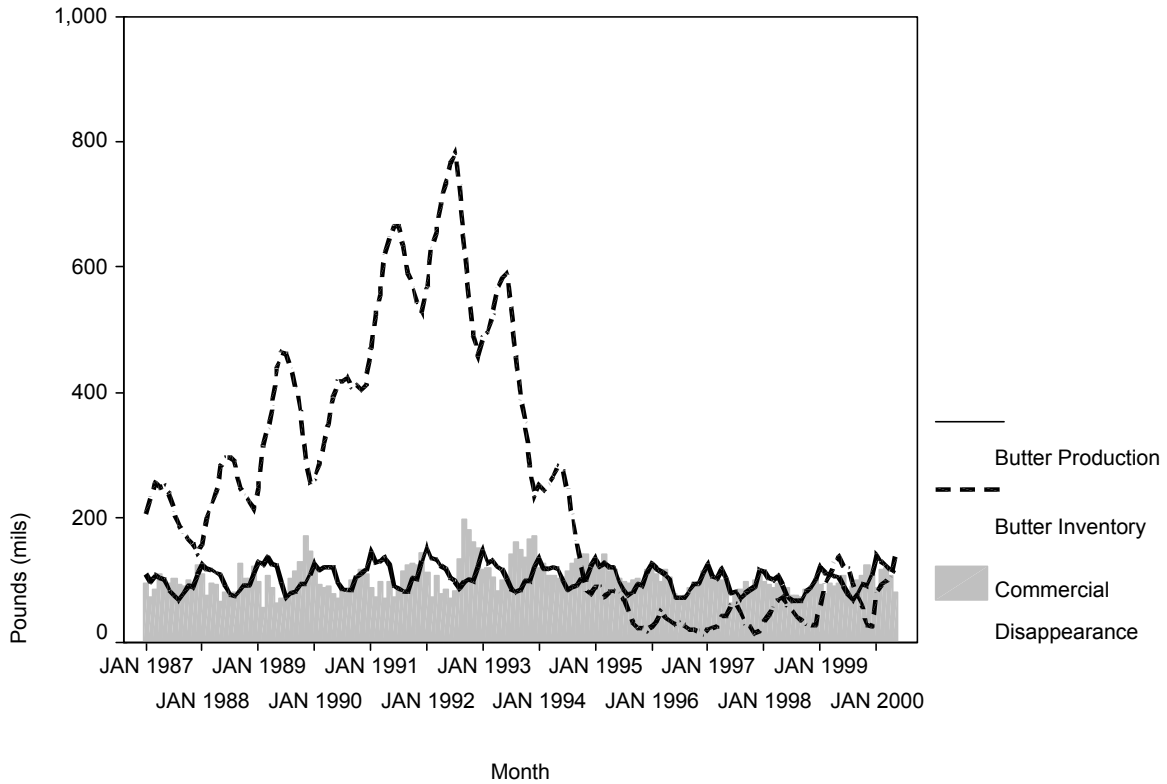
This study investigates the butter market over the period January 1987 through May 2000. This time period can be characterized as a period in which butter moved from a government-supported product with high inventories to a market-driven product. This change in the butter industry has created a butter price situation in which the industry has changed from a relatively stable butter price to one in which butter prices fluctuate wildly at, on average, somewhat higher levels. One of the keys to this change in the butter market is the level of butter inventories. A second factor may be the demand for butterfat in alternative uses such as cheese, ice cream, and cream cheese. This second factor is harder to evaluate, although the declining butter production with increasing butterfat supply due to increased milk production would suggest that there is a significant demand for butterfat from alternative uses.

The time period covered in this paper, January 1987 through May 2000, contains two distinctly different butter market scenarios, which can be seen in Figure 1. The first, from January 1987 through late 1995, was a period with steadily declining butter prices based primarily on a declining butter support price. During this time period, monthly butter stocks, i.e. inventory, rose from approximately 125 million pounds to almost 800 million pounds. The increasing butter stocks were the leading cause in reducing the butter support price in an attempt to reduce the inventories of butter and the resulting support price program costs that were being incurred by the Federal government. The lower butter prices caused a demand response, with commercial disappearance showing an increase over this time period from 1.1 billion pounds in 1987 to 1.5 billion pounds in 1993. Butter production, however, increased faster during this time period than did commercial disappearance resulting in large butter inventories. Beginning in 1993, commercial disappearance began to exceed the declining butter production, resulting in butter inventories declining steadily through 1995, reaching the lowest levels in many years.

The second time period, from late 1995 through May 2000, is characterized by very small inventory levels; production and commercial disappearance being almost equal; and

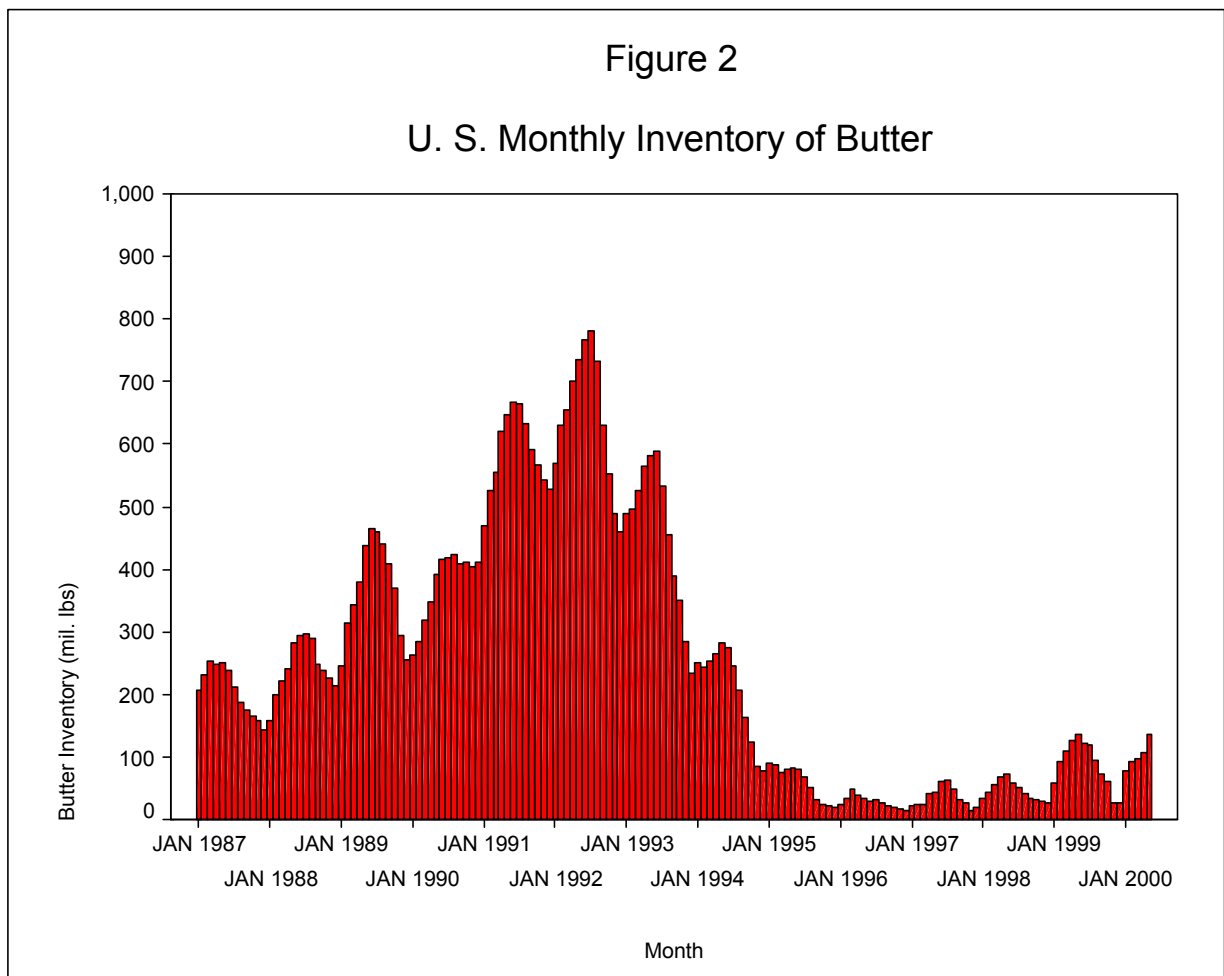
Figure 1

### Butter Inventory, Production, and Commercial Disappearance



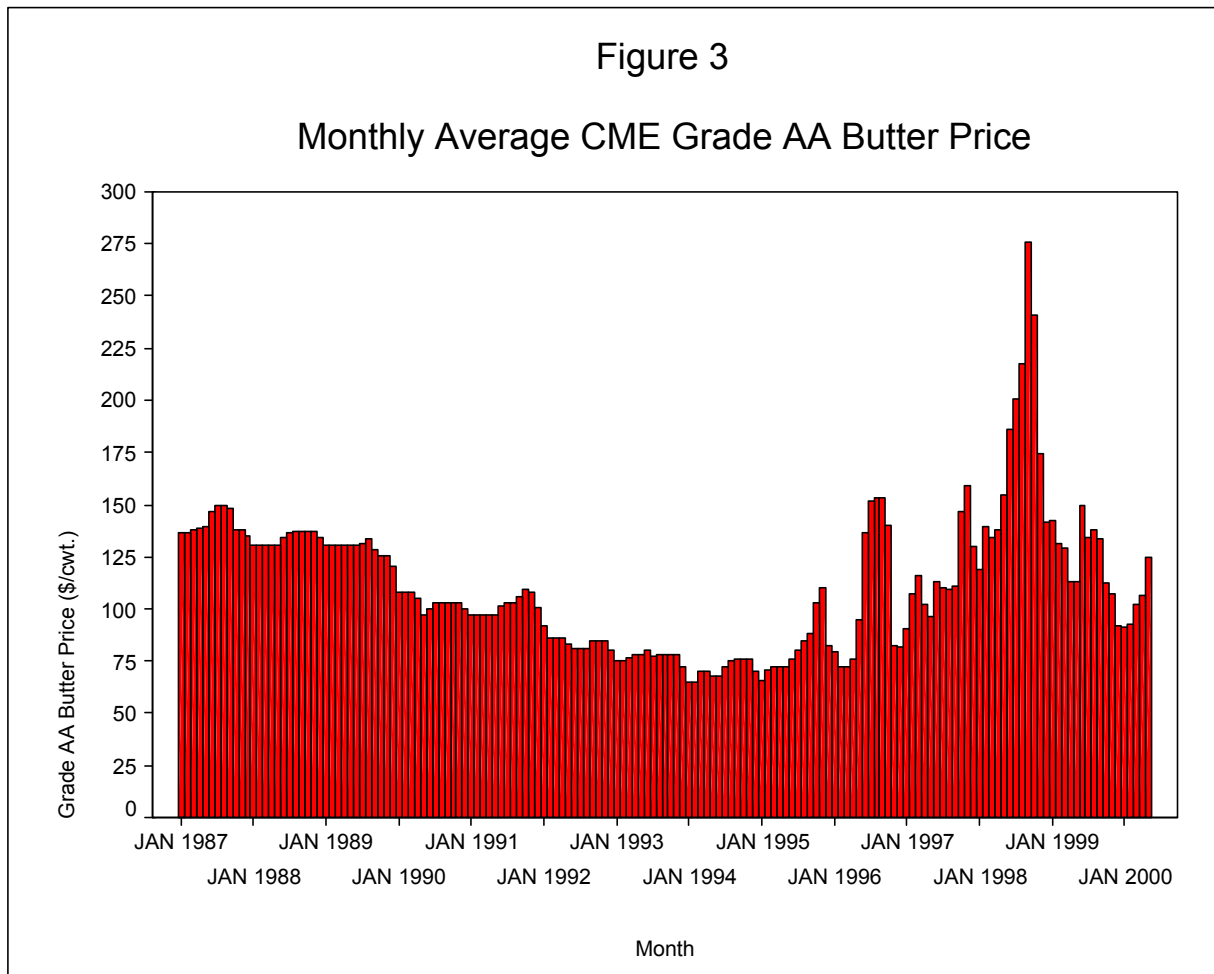
tremendous price volatility including record high butter prices. Butter inventories during this period averaged 35 million pounds a month during 1997 compared to 458 million pounds during 1993. In the four years of 1996 through 1999, commercial disappearance exceeded butter production by a total of 4.5 million pounds. In 1996 and 1999 commercial disappearance exceeded butter production while in 1997 and 1998 butter production exceeded commercial disappearance. The combination of low inventories and production equaling commercial disappearance created the conditions necessary for butter price volatility. From a low of approximately \$.70 per pound in February 1996 the Chicago Mercantile Exchange AA butter price rose to almost \$1.60 per pound in July of the same year before falling to around \$.80 per pound in October 1996. The butter price trended higher through 1997 and part of 1998 before taking off from \$1.34 per pound in March 1998 and reaching a high of over \$2.75 per pound in September 1998. The price then retreated to approximately \$0.92 per pound in December 1999 before starting to climb again to approximately \$1.25 per pound in May 1999.

A look at the butter market over the past twelve years may give some indication as to why the butter market is currently acting as it is and to what may happen to the butter market in the near future. The butter production data that were used are monthly data from the NASS publication *Dairy Products* as published in *Dairy Market News*. The butter cold storage data (butter inventory) are also published monthly by *Dairy Market News* from the monthly NASS publication *Cold Storage*. The commercial disappearance data were computed by adding the beginning monthly inventory to the monthly butter production and subtracting ending inventory. The monthly average CME butter prices were also obtained from *Dairy Market News*. For this particular study, imports and exports were not specifically included. Monthly population data were obtained from Population Estimates Program, Population Division, U.S. Census Bureau.



In Figure 2 the monthly butter inventory is shown, while Figure 3 presents the monthly average CME Grade AA butter price. A comparison of these two figures shows that as butter

inventories have declined the butter price has increased and become more volatile. The support price program, besides setting minimum prices at which the government will buy butter, effectively establishes a maximum price. This maximum is determined by the buy-back price, that is the price that butter may be bought back from the government. However, if the government does not have an inventory of butter, then the upper price limits are established by the market place. This has been the situation since January 1995 when government inventories were all but eliminated. In fact, beginning in early 1995 until early 1999 monthly butter invento-



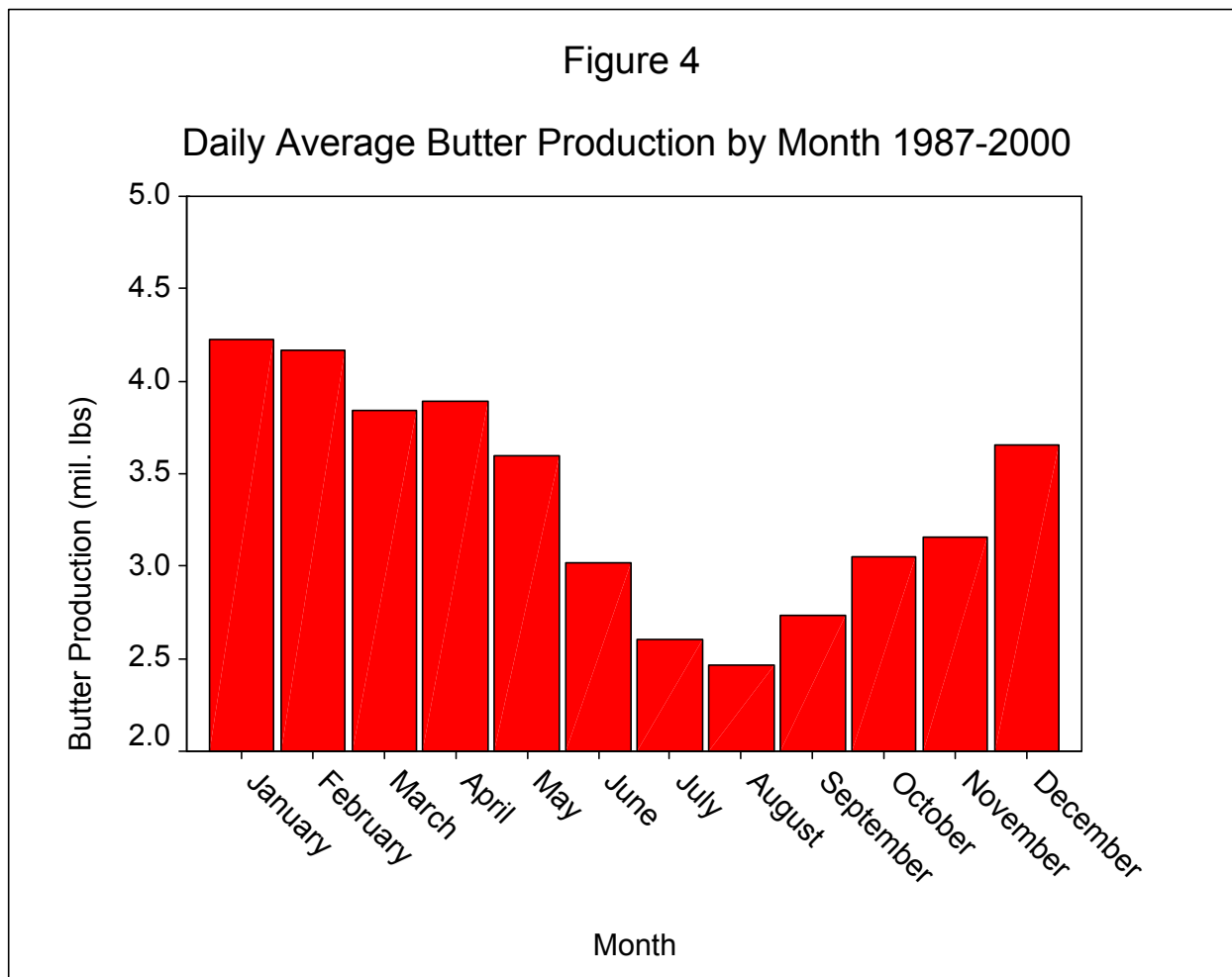
ries have declined to a level below monthly butter production.

So what happened to the large inventories of butter? One explanation is that, as inventories increased and the price decreased, per capita consumption, or in other terms per capita commercial disappearance, increased. From an economic viewpoint increasing consumption with declining prices would be expected. In fact, that is exactly what occurred. From 1987 through 1993 per capita daily average commercial disappearance increased from .0131

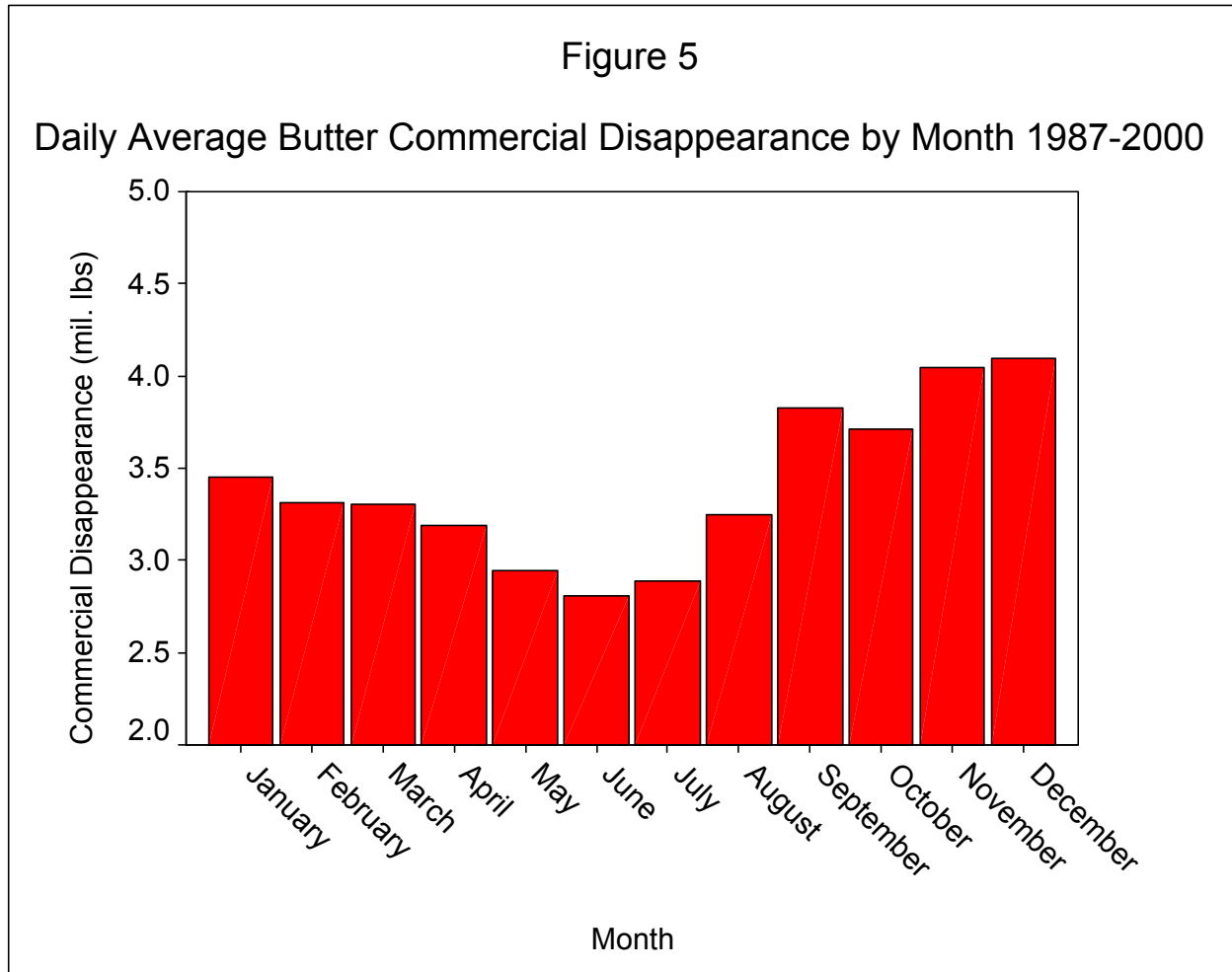
pounds to .0163 pounds, a 25 percent increase. Without a corresponding increase in butter production butter inventories declined approximately 225 million pounds in 1993 and an additional 157 million pounds in 1994. By late 1995, butter inventories were at the lowest levels they had been in many years.

Unfortunately, the higher, more volatile prices that have occurred since late 1995 have caused the expected reaction in per capita commercial disappearance. Per capita daily average commercial disappearance has declined from the high of .0163 pounds in 1993 to .0117 pounds in 1998 pounds. This decline in consumption coupled with higher production above the previous year has, in 1999, allowed monthly inventories to rise above monthly production for the first time since late 1994. It is interesting to note that, even with the increase in inventories and production, the butter price has remained relatively strong.

A certain level of butter inventories is critical to the butter market. As one can see in Figure 4 there is a definite seasonality to butter production. On a daily-adjusted monthly aver-



age basis, butter production in July is slightly more than half of the butter production in January. The decline in butter production during the late summer can be attributed to two factors: declining milk production with a reduction in butterfat test, and the demand for cream for other uses such as ice cream.

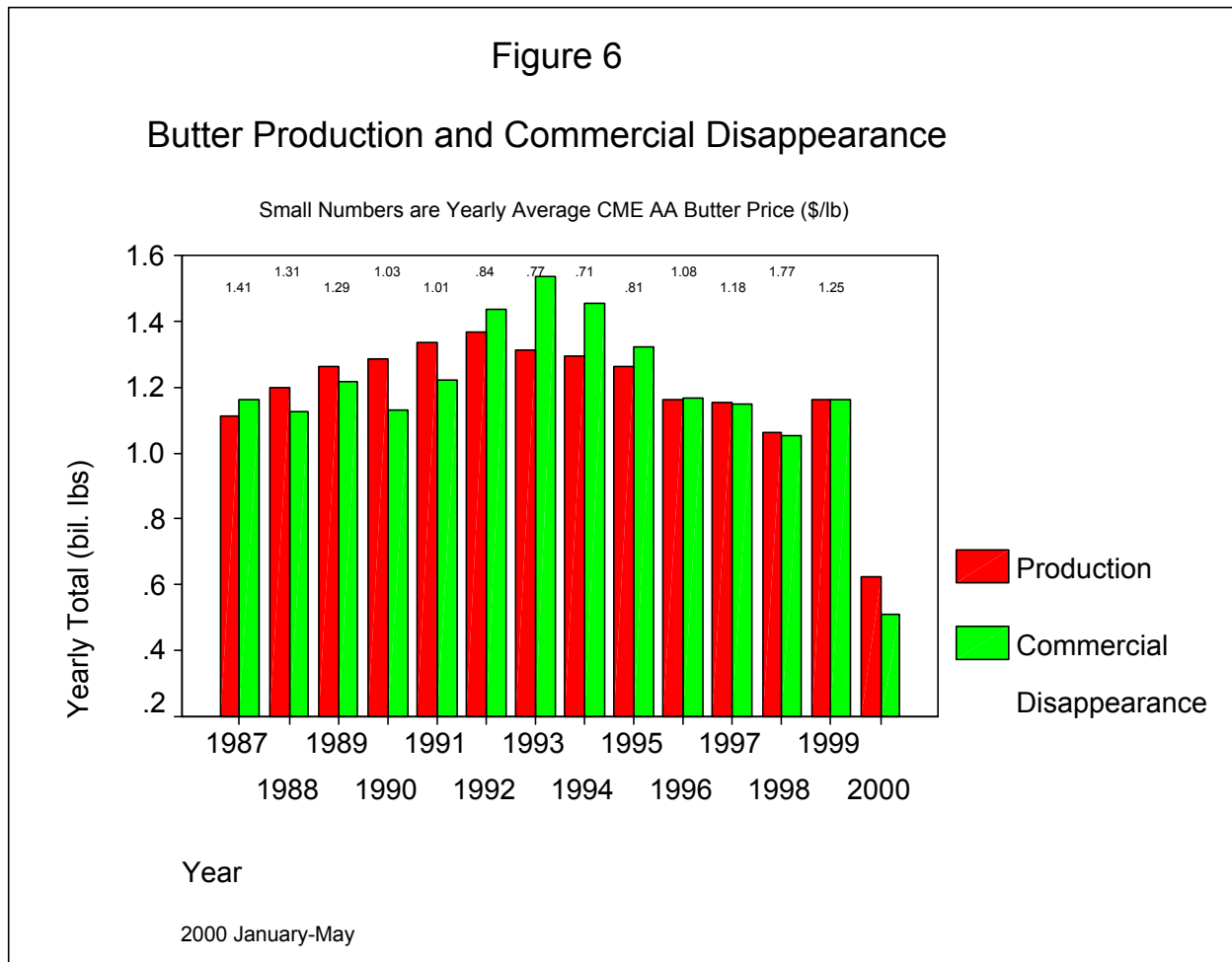


Contrast the seasonal butter production pattern shown in Figure 4 to the seasonal commercial disappearance shown in Figure 5. Butter production is clearly greatest in the first part of the year while butter consumption is highest during the latter part of the year. For instance, in January daily average butter production exceeds daily average consumption by approximately 700 thousand pounds, while in December daily average butter production averages approximately 500 thousand pounds below daily average consumption. This difference in production and consumption patterns explains why butter inventories have a major influence on butter prices.

Figure 6 shows total yearly butter production and commercial disappearance. With but-



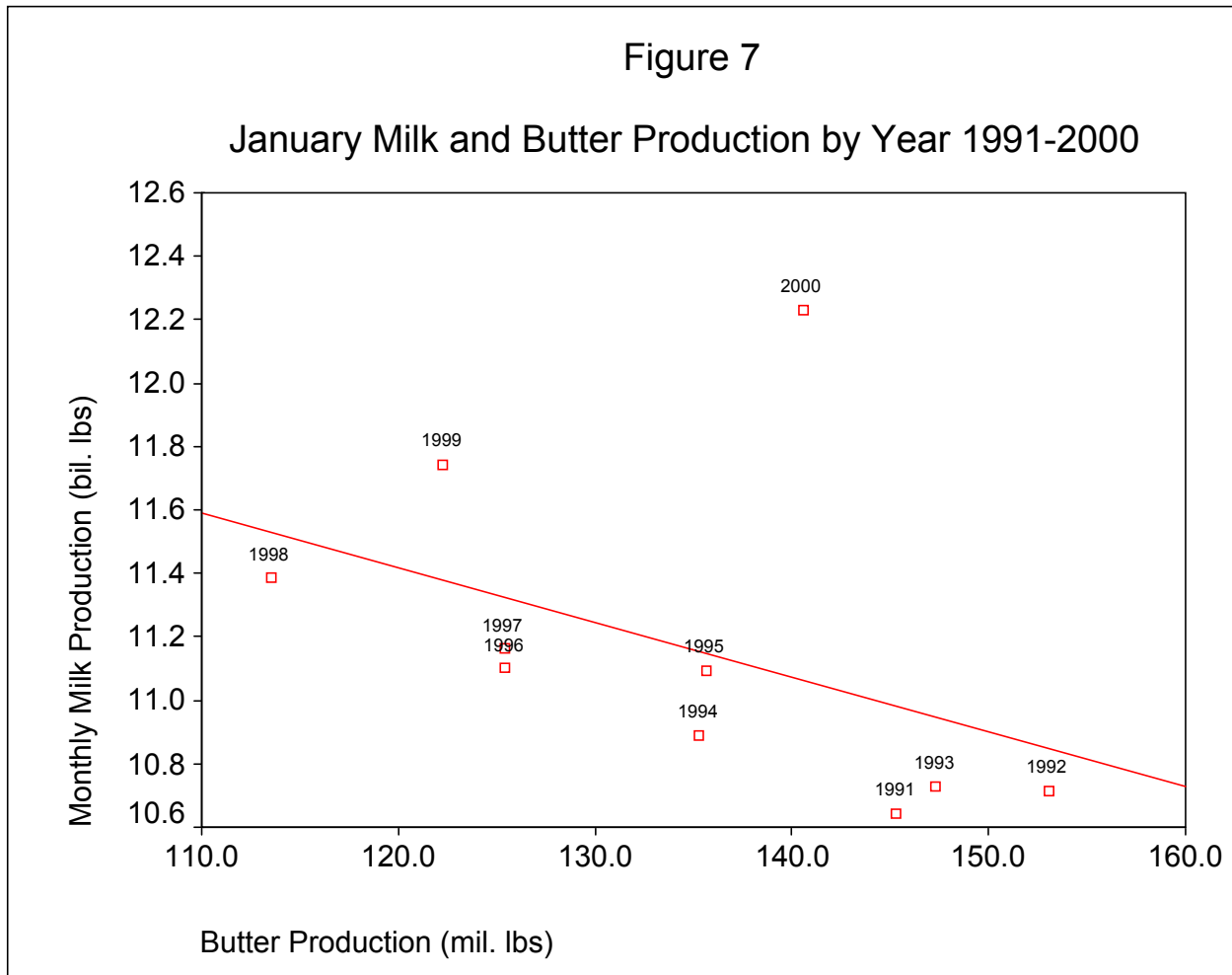
ter production and butter consumption being equal in each of the last three years and butter inventory averaging less than one month's production, it is easy to see why butter prices have been so volatile. During the years shown in Figure 6 the yearly average Grade AA butter price decreased from \$1.41 per pound in 1987 to \$0.71 per pound in 1994, and then increased to \$1.77 per pound in 1998 followed by a decline to \$1.25 in 1999.



Correlation coefficients were computed to investigate the relationships between various factors relative to the supply and demand for butter. Traditional economics would suggest that the relationship between the price of butter and the production of butter would be positive, that is, as the price of butter increases so would the production of butter. However, the result was the opposite, with a significant negative correlation coefficient between the price of butter and the production of butter. The data indicate that as the butter price declined in the late eighties and early nineties, from \$1.41 per pound in 1987 to \$.71 per pound in 1994, butter production continued to increase in the face of stagnant commercial disappearance. Commercial disap-

pearance increased significantly in 1992, 1993, and 1994, erasing the large surplus that had been created and turning around the declining butter price (Figure 6). Much of the reduction in the butter price was certainly due to the reduction of the government support price and not necessarily market activity, since the government would buy butter at the support price, thus, insulating the butter supply from market forces.

It is particularly interesting that butter production has declined with increasing milk production. Since increasing milk production has resulted in an increase in butterfat, one would expect an increase in butter production. The increase in butter production has certainly not occurred. Figure 7 shows NASS monthly milk production and monthly butter production for the month of January for the period 1991 through 2000. The remaining months of the year show a similar pattern.



In addition, the uses for cream or butterfat are competing for a limited raw material re-

source. The relationship between milk production and butter production as determined by computing a correlation coefficient is approximately zero over the period January 1991 through May 2000. However, on a monthly basis, there is a varying degree of correlation between milk production and butter production. For instance, in January, shown in Figure 7, there is a high negative correlation, with butter production declining with increasing milk production. In September, there is almost no correlation between milk production and butter production. In all months there is also a definite relationship to the year, with butter production declining from 1991 to the present, except for 1999, which had a slight increase in butter production.

Declining butter production accompanied by increasing supplies of butterfat and an increasing butter price would indicate that the demand for butterfat and hence the increased butter price may be attributable to the demand for cream from other uses of butterfat such as ice cream, cream cheese, and cheese.

On the demand side, one would expect per capita commercial disappearance to decline with increasing butter prices. The relationship between the butter price and per capita commercial disappearance was as expected, with a significant negative correlation coefficient. On a yearly basis, commercial disappearance increased with the declining butter prices of the late 1980's and early 1990's and has declined with the increasing butter prices that have occurred since 1995. However, on a monthly basis the relationship between the butter price and the per capita commercial disappearance varied significantly from a correlation coefficient of .029 to .732.

Since per capita commercial disappearance has responded as would be expected to butter price changes, the explanation for the butterfat price volatility rests heavily on the supply side. As we have seen, butter production has in fact declined as the butter price has increased in combination with an increasing supply of butterfat. Probably the most important factor in explaining this phenomena is that there is no effective market setting mechanism for butterfat used in products other than butter. Cream used in ice cream, cream cheese and other products is priced based on the butter market. The result is that the butter price reflects not only the demand for butter but the demand for cream used in other products. The demand for cheese also has an effect on the demand for cream (butterfat) since a high demand for cheese relative to butter causes the value of butterfat in cheese to be worth more than butterfat in butter. For butterfat to be "freed up" for use in butter and other cream products the price has to rise relative to the butterfat value in cheese. The demand for butterfat in cream products and

cheese can therefore cause fluctuations in the butter price which may not be justified based solely on the supply and demand for butter. The combination of relatively tight butter inventories and the demand for butterfat in other uses will continue to create the conditions for a highly volatile butter price.

Results of this report indicate that:

- The butter market will continue to show a high degree of price volatility reflecting the tight supply/demand situation for butter,
- The butter price represents the supply/demand situation for butterfat used in butter as well as butterfat used in other products,
- Butter production and the butter price are inversely related, that is as the butter price increased, butter production declined,
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