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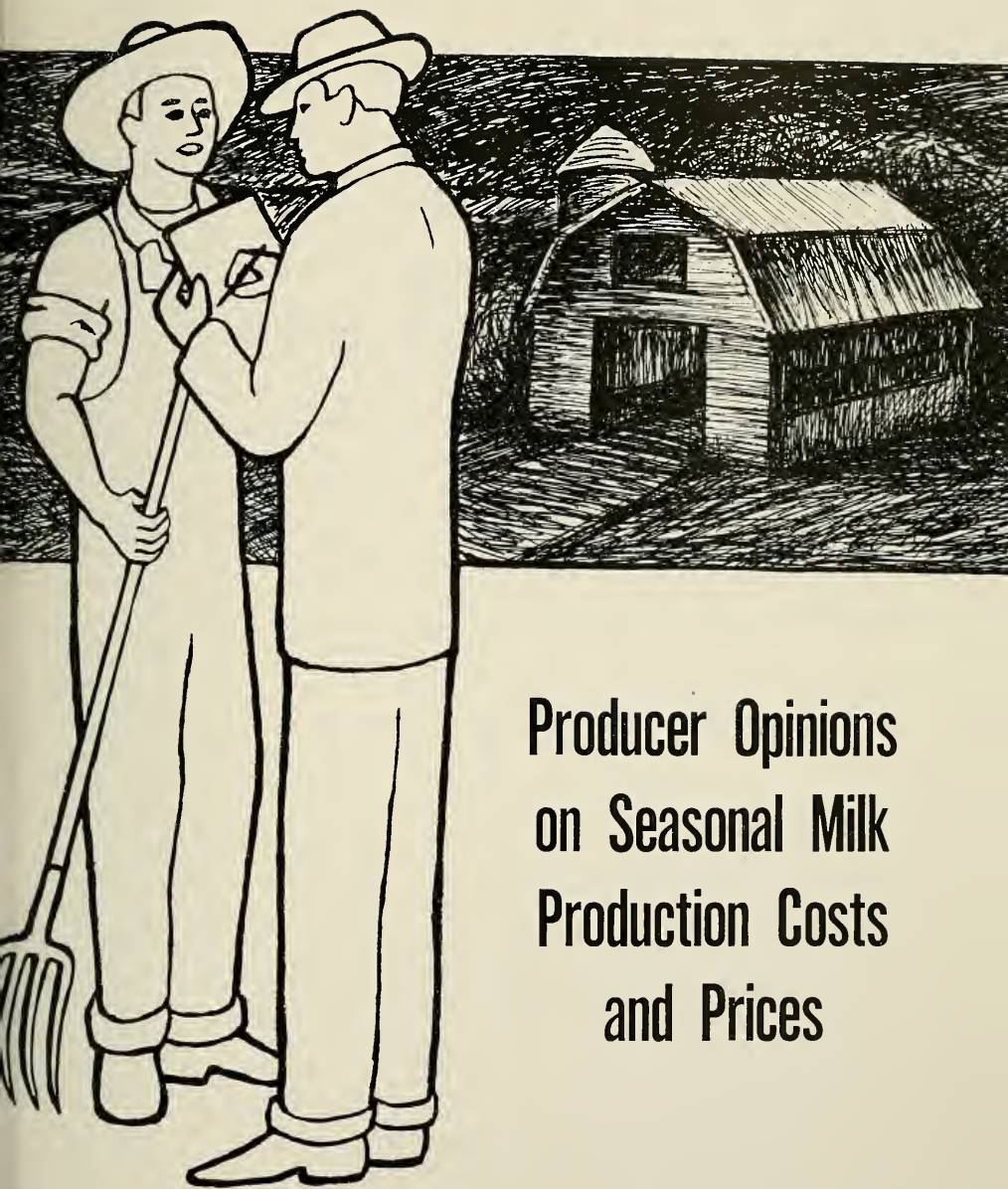
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Producer Opinions on Seasonal Milk Production Costs and Prices

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WEST VIRGINIA UNIVERSITY AGRICULTURAL EXPERIMENT STATION

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Summary

ALL shortages of milk occur in many fluid milk markets. Insufficient seasonal price adjustments sometimes appear to be one of the reasons for these shortages. To determine producer opinions on seasonal cost and price variations, those producers selling milk to fluid milk distributors in the Charleston, West Virginia market during the fall of 1956 were interviewed. These producers indicated that to produce one-tenth more milk than they had produced the preceding fall they would require approximately 86 cents more per hundredweight than they had received in July 1956. Also, they would require an additional \$1.04 and \$1.30 per hundredweight to produce one-fifth and one-third more milk, respectively, than they had produced during the preceding fall. These prices were 17, 21, and 26 per cent higher, respectively, than the market average price per hundredweight for milk of average test during July 1956. They were also 4, 8, and 12 per cent higher, respectively, than the prices which subsequently were paid for milk of average test during the months of October, November, and December the same year.*

The producers also believed production costs vary with the seasons. They estimated that their costs per hundredweight were \$3.49 in the spring, \$3.64 in the summer, and \$4.50 in the fall and winter. Since producers believe that production costs are higher in the fall, they expect higher prices during the fall months.

Among the more important obstacles to fall production given by producers were breeding difficulties, deficiencies in roughages and pasture, and inadequate prices for added production.

*In the Charleston market, milk producers were paid under a base-surplus pricing system and hence each producer's price might differ from that of other producers, depending on the amounts of his base and surplus milk and the prices established for these classes of milk.

ACKNOWLEDGMENTS

This report is based on replies to questions asked milk producers who shipped milk to the Charleston, West Virginia market during September 1956. Their cooperation in providing answers is greatly appreciated. Mr. Owen Williams and the staff of the Charleston office of the Dairymen's Cooperative Sales Association also gave valuable assistance in contacting producers. Norman Nybrotten, formerly of the West Virginia University Agricultural Experiment Station, provided valuable assistance in planning and analyzing the study. Stuart Forstall conducted the interviews with producers, and Mrs. Mary Templeton assisted with the tabulations. Their help is gratefully acknowledged.

Producer Opinions on Seasonal Milk Production Costs and Prices

JAMES H. CLARKE

The Problem

MILK producers customarily produce more milk during the spring months than at other times of the year. Production during the fall months is frequently low in contrast to production in other seasons of the year. Natural influences affect this variable milk production.

Market demands for fluid milk are much more uniform throughout the year than is milk production. These conditions of relatively variable production and relatively uniform demand often result in a fall shortage of milk for many fluid milk markets. To encourage a more even seasonal production, prices often are adjusted seasonally, with higher prices established for the fall months than for other months. This is done, in part, because milk production costs are thought to be highest in the fall months.

Inasmuch as fall shortages of milk continue to exist in many markets, it is believed that sufficient seasonal price adjustments have not been made. Also, milk production costs during different seasons are difficult to determine because of inadequate records and the arbitrary decisions in accounting which are required.

It seems logical that a milk producer's ideas or opinions have an important bearing on his readiness to adjust production to market prices and costs—and consequently to market demands. Such ideas and opinions may have a more important influence on producer actions than pertinent price relationships, which are often obscure or slow to become known.

Procedure

In order to discover how producers would respond to postulated price conditions, farmers shipping milk to the Charleston market in September 1956 were asked to give their estimates on production costs in different seasons of the year and on prices required to induce specified increases in fall production.

Two approaches were used in obtaining this information. In one, producers were asked their opinions on seasonal production costs. In

the other, producers were asked what price increases would induce them to increase fall production by specified amounts. To reduce bias, the producers were divided at random into two groups. One group received a questionnaire on seasonal production costs and the other a questionnaire on price increases needed to induce specified increases in fall production. That part of the questionnaire pertaining to seasonal variation in costs will be referred to as "cost questions" and that part of the questionnaires pertaining to prices for increased fall production will be referred to as "price questions." In each case, the questionnaires included other questions dealing with the volume of milk marketed daily in September 1956 and with the butterfat test of the milk during the spring, summer, and fall and winter. Also included was a question asking what would be the most important obstacles or problems entailed in increasing fall milk production.

The two producer groups were selected from an alphabetical payroll list made available by the Dairymen's Cooperative Sales Association, which supplied virtually all of the producer milk received by distributors in the Charleston market. On September 4, 1956, 519 questionnaires were mailed. A flip of a coin determined that the producers with odd numbers would receive price questionnaires and those with even numbers cost questionnaires. To assure the identification of the replies, a stamped self-addressed return envelope marked with the correspondent's name and address was included with each questionnaire. Returns of these questionnaires included 39 answers to cost questionnaires and 54 answers to price questionnaires, or a total of 18 per cent of those mailed. On October 4, 1956, after replies had apparently ceased to arrive, second questionnaires were mailed to those who had not responded to the first mailing. The "price questions" were rephrased because replies had not been complete in all cases and the "cost questions" were repeated in the second questionnaires. Follow-up letters also were sent to those not responding in full or clearly to the first "price questions." The second mailing resulted in replies to 27 more cost questionnaires and 35 more price questionnaires, or an additional 12 per cent. Thus, in all, replies were received from 30 per cent of the producers on the original mailing list.

Significance of Response to Different Types of Mail Questionnaires

It was assumed that if milk producers were equally willing to reply either to the price or to the cost questionnaires, the number of

replies to each would be approximately the same, because 260 received the price questionnaires and 259 received the cost questionnaires. The replies were not equal, however, with 66 being received for the cost questionnaires and 89 for the price questionnaires. Thus, significantly¹ more producers replied to the price questionnaire than replied to the cost questionnaire. Nevertheless, usable replies on cost and price opinions were approximately equal, with 60 replies to the "cost questions" and 58 to the "price questions." However, some returned questionnaires did not provide complete answers to all questions and could not be included in all tabulations.

It is probable that producers were more willing to answer price questionnaires than cost questionnaires because market prices are frequently reported and discussed, are generally applicable to a large number of producers and because their effect on producer incomes is quickly apparent. Costs, on the other hand, are less widely discussed, vary from producer to producer, and are composites of several items. The accurate computation of costs is difficult and tedious, and their effect on producer incomes frequently is not readily discerned. It should be noted, however, that producers' opinions, rather than computations, were requested.

Interviews

Because 70 per cent of the producers did not reply to the mailed questionnaires, it was decided to interview a sample of non-respondents to learn whether their opinions would be similar to those of producers who had responded by mail. In an attempt to get a sample of one-sixth of the non-respondents, 66 names were drawn, allowing a margin for those whom it might not be possible to interview. After the second name had been drawn by chance from the first six as the starting point, subsequent names were drawn systematically. Of the 66 producers selected, interviews were obtained with 51. The remaining 15 were not located, were eliminated by restrictions on travel,² or were not at home when calls and return calls were made.

Of the 51 producers visited, 4 had gone out of business and did not furnish satisfactory replies. The remaining 47 provided replies to 45 "cost questions" and 46 "price questions." After the first three interviews,³ each producer was asked both the "cost questions" and the "price

¹The chi-square test indicated a probability of a difference as great as this, due to chance, in only about 4 per cent of the cases.

²Not to travel more than 40 miles, round trip, to obtain a single schedule or to make a return call on one producer.

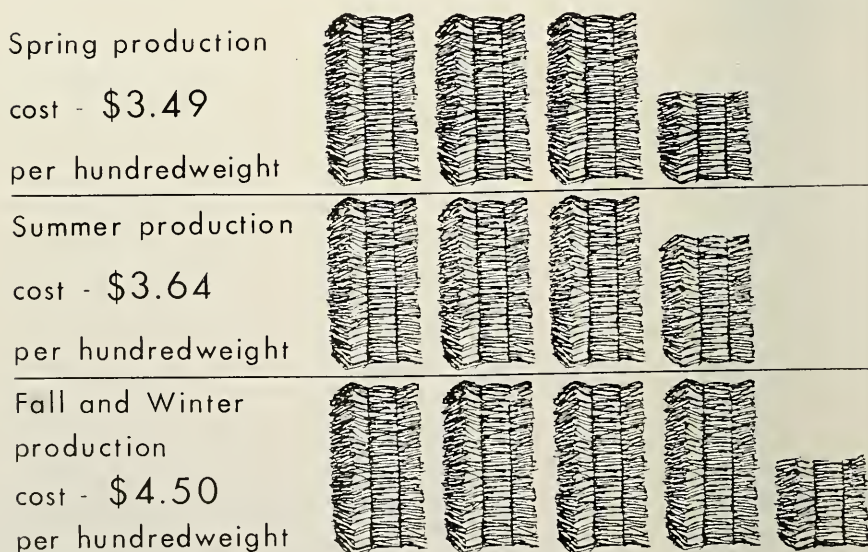
³On the basis of experience gained in the first three interviews it seemed feasible to ask both "price and cost questions" of each interviewee.

questions." The order of asking the "cost" and "price" questions was alternated as producers were interviewed. Questions common to both were asked only from the one taken first. As might be expected, replies were more complete from questionnaires originating with personal interviews than from those obtained through the mail.

Analysis of variance of the quantities of milk marketed daily by the producers receiving the original questionnaires, by those who received the follow-up questionnaires, or by those who were interviewed on their farms showed no significant differences in average quantities of milk marketed by the different groups. Average butterfat tests among producers in the several groups varied little for the same season, and were 3.81 per cent in the spring, 3.83 per cent in the summer, and 4.03 per cent in the fall and winter. Because producers replying to mailed questionnaires had milk marketings and butterfat tests similar to those in the systematic sample interviewed, it is assumed that in other respects the producers answering mailed questionnaires also were representative of producers selling on the Charleston market.

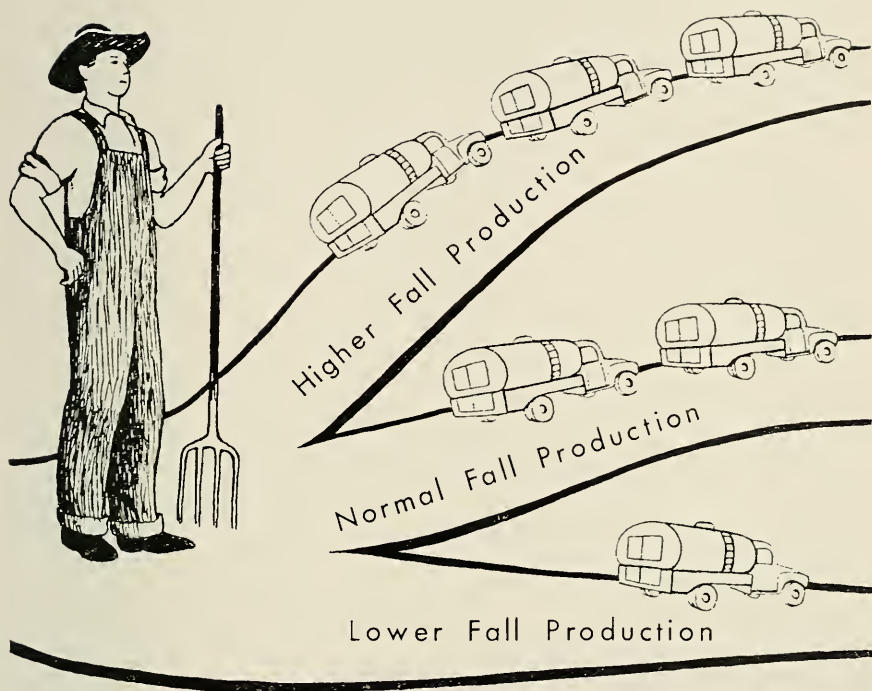
Producer Opinions on Seasonal Costs

An analysis of producer opinions on seasonal production costs was made from each of the three sources of information, namely, the



PRODUCER opinions indicated they believed the cost of producing a hundred-weight of milk in the various seasons to be as indicated above. Since they believed costs to be substantially higher in the fall and winter months, it is logical that they expect higher prices for milk produced in the fall months.

Which Way Will He Go?



PRODUCER opinions on milk production costs and prices are believed to be more important determinants of producer action with regard to fall milk production than the facts which are often obscure or are made known only after production has been completed.

original mailed questionnaire, the follow-up mailed questionnaire, and the personal interview. The summary of the data from these three sources is given in Table 1. The producers' opinions concerning their average (mean) production costs during the spring, summer, and fall and winter differed sufficiently to be highly significant. This was true for each of the three sources of information. It does not mean that the costs shown are true estimates of actual costs during these seasons but it does show that producers believed production costs in the several seasons to be different. The opinions of all producers replying showed an average cost of \$3.49 for producing a hundredweight of milk in the spring, \$3.64 in the summer, and \$4.50 in the fall and winter.⁴

⁴There were no significant differences in the opinions concerning mean costs for a particular season among the three sources of data.

TABLE 1. PRODUCER OPINIONS OF COSTS PER HUNDREDWEIGHT OF PRODUCING MILK, CHARLESTON, WEST VIRGINIA MILKSHED, 1956, BY SOURCE OF INFORMATION

SOURCE OF INFORMATION	NUMBER REPORTING	AVERAGE PRODUCTION COSTS STATED BY PRODUCERS, FALL, 1956			
		TYPE OF AVERAGE	SEASON**		
			SPRING	SUMMER	FALL & WINTER
DOLLARS PER CWT.					
Original Mailed Questionnaire	36	Mean	3.34	3.57	4.38
		Median	3.35	3.765	4.50
		Mode	†	4.00	5.00
Follow-up Mailed Questionnaire	24	Mean	3.34	3.57	4.93
		Median	3.275	3.715	4.90
		Mode	4.00	‡	5.00
Personal Interview of Sample of Non-respondents	45	Mean	3.69	3.73	4.46
		Median	3.90	4.00	4.50
		Mode	4.00	4.00	5.00
Average, All Sources	105	Mean	3.49	3.64	4.50
		Median	3.50	3.75	4.50
		Mode	4.00	††	5.00

*The number reporting for spring, summer, and fall and winter varied slightly, but the number shown here is the minimum for each source of information.

**Seasons were defined as follows: spring (first three months of pasture, about April 16 to July 15), summer (second three months of pasture, about July 16 to October 15 or end of pasture season), fall and winter (barn feeding period, October 16 to April 15).

†Bi-modal \$3.00 and \$4.00.

‡Bi-modal \$2.00 and \$4.50.

††Bi-modal \$3.50 and \$4.00.

Producer Opinions on Price Increases Necessary to Induce Increased Fall Production

Analysis of the replies to the "price questions" was made from each of the three sources of information. A summary of this analysis is given in Table 2. Producers were asked what increase over their July 1956 price was needed to induce them to produce one-tenth, one-fifth, or one-third more milk in the fall months than had been produced the preceding fall (1955). The mean price increase for all producers replying to these questions, disregarding marketings among individual producers, indicated that 86 cents per hundredweight would be needed to induce them to produce one-tenth more fall production, and that \$1.04 and \$1.30 per hundredweight would be needed to induce one-fifth and one-third more, respectively.

Producers replying to both the original and follow-up questionnaires indicated that they would require significantly greater price increases to produce progressively larger quantities of milk in the fall than

TABLE 2. PRODUCER OPINIONS OF PRICE INCREASES NECESSARY TO INDUCE SELECTED FALL PRODUCTION INCREASES, CHARLESTON, WEST VIRGINIA MILKSHED, 1956, BY SOURCE OF INFORMATION

SOURCE OF INFORMATION	NUMBER REPORTING	AVERAGE PRICE INCREASES STATED AS NECESSARY TO INDUCE PRODUCTION INCREASES IN FALL ** MONTHS ABOVE 1955 FALL PRODUCTION			
		TYPE OF AVERAGE	FALL PRODUCTION INCREASE OF:		
			ONE-TENTH	ONE-FIFTH	ONE-THIRD
DOLLARS PER CWT.					
Original Mailed Questionnaire	37	Mean	.89	1.05	1.34
		Median	.75	.90	1.00
		Mode	.50	.75	1.00
Follow-up Mailed Questionnaire	21	Mean	.79	1.21	1.68
		Median	.60	1.00	1.00
		Mode	†	.75	1.00
Personal Interview of Sample of Non-respondents	36	Mean	.86	.96	1.05
		Median	1.00	1.00	1.00
		Mode	1.00	1.00	1.00
Average, All Sources	94	Mean	.86	1.04	1.30
		Median	.75	1.00	1.00
		Mode	1.00	1.00	1.00

*The number reporting for production increases of one-tenth, one-fifth, and one-third varied slightly, but the number shown in this column was the minimum for each source of information.

**Fall defined as October, November, and December.

†Bi-modal \$.50 and \$1.00.

they had produced in the preceding fall.⁵ In the case of the personal interviews, the price increases given, although progressively higher for greater production of milk, did not differ sufficiently to be statistically significant.⁶ Pooled data from the three sources showed that the prices stated as needed for the three stipulated production increases differed enough to be considered highly significant.⁷

Inferences

Because producers' opinions indicate that they believe their fall and winter production costs are \$1.01 per hundredweight higher than in the spring and 86 cents per hundredweight higher than in the summer, it is logical to conclude that they expect higher prices in the fall months. Although normal prices received by producers in this market

⁵Differences of prices on the original questionnaire gave an F ratio of 4.62 where ratios of 3.08 were required for significance at the 5 per cent level and 4.80 at the 1 per cent level. Differences of prices on the follow-up questionnaire gave an F ratio of 5.01 where a ratio of 5.01 was required at the 1 per cent level.

⁶F ratio was 1.72 with a ratio of 3.09 needed for significance at the 5 per cent level.

⁷Among the three sources of data, there were no significant differences in the mean prices needed to increase fall production (either by one-tenth or one-fifth) over production of the preceding fall. However, to increase fall production one-third over the previous fall, the mean difference among the three sources were significant at the 5 per cent level.

Normal Fall Production



If paid 86¢ per/cwt. over July price



If paid \$1.04 per/cwt. over July price



If paid \$1.30 per/cwt. over July price

Would
Increase
Production

+10%



+20%



+33 1/3%



PRODUCERS' opinions regarding prices they would require to induce them to increase their fall milk production.

actually are higher in the fall than in the spring and summer, producers' opinions indicate that even higher prices would be needed to induce them to produce more milk in the fall. It should be noted that this conclusion is based only on producers' opinions. In actual practice, larger or smaller price increases may be necessary to bring about the needed increases in fall milk production. Nevertheless, these producer opinions should serve as a guide to producer association price committees, milk handlers, government agencies, and others who are concerned with establishing producer prices for fluid milk.

Deterrents to Increasing Milk Production in Fall Months

In addition to the "cost" and "price" questions, producers also were asked: "What are the most important problems or obstacles to increased fall (October, November, and December) milk production on your farm?" Replies to this question were classified and are shown in Table 3. The obstacle most frequently mentioned was regulation of

TABLE 3. OBSTACLES TO OR PROBLEMS WITH INCREASING MILK PRODUCTION IN FALL MONTHS* LISTED BY PRODUCERS SELLING MILK ON THE CHARLESTON, WEST VIRGINIA MARKET, FALL, 1956

OBSTACLES OR PROBLEMS	NUMBER LISTING**	PER CENT
Breeding rotation not properly regulated and other breeding troubles, including those connected with artificial insemination.	73	22.3
Shortage, poor quality, or lack of hay and silage.	48	14.7
Shortage, poor quality, or lack of fall pasture.	34	10.4
Price for added production inadequate.	30	9.2
High cost of feed.	21	6.4
Lack of capital for improvement or expansion of buildings and equipment or the lack of sufficient buildings and equipment.	18	5.5
Shortage, high cost, or lack of labor.	17	5.2
Lack of land on which to raise feed or graze cattle.	7	2.2
Already producing heavily in fall.	6	1.9
No obstacles or problems.	5	1.5
Insufficient cows.	5	1.5
Didn't want to increase in fall.	3	.9
Other reasons.	35	10.7
No comment.	25	7.6
TOTAL	327	100.0

*Fall months defined as October, November, and December.

**Total exceeds number of replies (201) since several producers listed more than one obstacle or problem.

the breeding schedule and related problems; next were deficiencies in hay, silage, and pasture. Either inadequate prices for added production or higher cost of feed were listed by 15.6 per cent of the respondents as obstacles to increased fall production. Producers in these latter groups, at least, might be ready to make production adjustments if given the proper price incentives because the obstacles they list are price oriented. It should be kept in mind that producers find it necessary to make production adjustments by adding additional cows, additional labor, or units of other production factors which frequently cannot be added in small quantities. Inducing some producers to make these larger shifts in their production could be effective in bringing about smaller relative changes in the supply for the entire market. Many of the obstacles to increasing fall milk production, as listed in Table 3, might be overcome if producers had either adequate incomes or more resources.

Most of the obstacles to increased fall production, as mentioned by producers, are not new, but a knowledge of their relative importance to producers is valuable either in the determining or forecasting supplies of market milk—seasonal or otherwise. Producers have indicated that

they are willing to cope with these obstacles if given suitable price incentives. The long-run validity of these indications will depend upon the accuracy of producers in determining the nature and intensity of the obstacles to increased fall production. The short-run shifts in production made by producers are dependent on their willingness to make production shifts as a result of the incentives offered, without regard to the long-run economic rationality of the shifts made.

