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Analysis of Leading Alternative

Dairy Price

Support Program Proposals

by

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### Preface

Andrew M. Novakovic is an Associate Professor in the Department of Agricultural Economics at Cornell University.

This paper was prepared prior to the discussion of the dairy bill of the Food Security Act of 1985 (H.R. 2100) on the floor of the House of Representatives, for the use of Congressional staff members and other interested parties.

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Numerous proposals for revising the dairy price support program have been introduced in Congress or suggested by interested parties. The analysis presented here estimates the consequences of two leading proposals and a third approach that combines features of the first two and which might be viewed as a compromise position.

Dairy Unity Act (H)

The dairy title of H.R. 2100--The Food Security Act of 1985, recently approved by the House Agriculture Committee, is the basis for the first proposal analyzed herein. This is a slightly modified version of the so-called Dairy Unity Act, which was primarily based on a proposal by the National Milk Producers Federation. The dairy title of H.R. 2100 combines three major elements: 1) revised procedures for setting the support price, 2) a milk diversion and assessment program, and 3) legislated increases in Class I prices in most federal orders. An outline of the bill is provided in Appendix A.

The price setting procedure embraces what is generally known as the dairy parity approach. Prices are calculated according to a formula involving an index of prices paid by farmers for inputs they buy to produce milk, with adjustments for increases in dairy farm productivity as measured by milk production per cow. These steps are discussed below and an example is shown in Table 1.

First, a "cost of production index" is calculated. This index is similar to the prices paid index used in the traditional parity price calculation, but it is intended to better represent input and other characteristics specific to dairy farming, as opposed to all agriculture. Secondly, this index is adjusted for increases in production per cow. The adjusted index is then multiplied by a base price, the product being the preliminary support price. A supply/demand adjuster is used in the third step. USDA net removals during the next marketing year are estimated based on this preliminary price. If projected net removals exceed four to five billion pounds, then the support price must be reduced according to a specific schedule (about 2.6% for every one billion pounds above five billion with a maximum adjustment of 7.8%).

If the Secretary of Agriculture determines that, even with the foregoing price setting process, net removals less the milk equivalent of imports in the next marketing year will exceed seven billion pounds, then he must institute a Milk Diversion Program (MDP). (Imports generally run

between 2.5 and 3 billion pounds, M.B. on a fats basis.) If projected net removals less imports are five to seven billion pounds, then the Secretary may use a MDP if he desires. If net removals less imports are estimated to be below five billion pounds he may not use a MDP.

Most of the new diversion program is identical to the old MDP; however there are three key differences. The first has already been mentioned; the new program is renewable. Secondly, under this plan the assessment would be variable and tailored to cover any program costs above that associated with net removals of five billion pounds. Another deviation from the old MDP is that this plan would permit a buy-out or 100% option (it has also been referred to as a whole-herd or whole-base option). That is, a producer could agree to cease production altogether, but he must do so for a period of three years. Payments under the buy-out option would be determined by a bidding system. The normal base would be marketings between July 1, 1984 and June 30, 1985. For those who participated in the old MDP, their new base would equal their old base plus 2.2%.

The pricing formula under the House Bill virtually guarantees that a diversion and assessment program will be necessary to cap net removals and government costs. Estimates of the farmer assessment range from 25 cents to \$1.25 per cwt. For a 5-30% MDP, estimates of 50 to 75 cents per cwt are reasonable. Although it is difficult to estimate, it appears that a buy-out program offered on a bid-basis might cost as little as half as much and therefore require half the assessment. Even with an assessment, the House Bill results in higher cash receipts to farmers, however consumers pay for much of this in the form of higher prices and consumption suffers in turn.

The third major feature of the House Bill would rather arbitrarily increase Class I prices in 35 of the 44 federal milk marketing orders. In the Chicago Regional order the Class I differential would increase from \$1.26 to \$1.40. In the New York-New Jersey order the increase would be from \$2.84 to \$3.14; in Southeastern Florida the increase would be from \$3.15 to \$4.18. The weighted average increase is in the neighborhood of 30 cents per cwt. Of the nine orders in which Class I prices are held at current levels, eight are the westernmost federal orders. Reportedly, the designers of these changes felt it necessary to keep federal order prices in the West in line with prices set under the California state orders. In the orders east of the Rockies, the rationale for these increases is that Class I differentials should reflect transportation costs from the upper Midwest; yet they haven't been adjusted since 1969. The merits of this reasoning, much less the specific increases, are hardly subject to universal agreement.

Another feature would require all federal order farmers to reimburse cooperatives for so-called marketwide services, i.e. for services that benefit non-members as well as members. The principal example of such a service would be balancing of market supplies, i.e. providing manufacturing outlets for milk not needed to serve Class I markets. Economists generally agree that cooperatives provide marketwide services; however it is not at all clear how these services should be valued. This could be a very important feature of the House Bill, but its impact at this stage is impossible to determine with any precision.

### A Price Cutting Approach (S)

The Senate Agriculture Committee has recently endorsed a bill that primarily features straightforward price cuts. A similar proposal has been introduced in the House by Congressmen Olin and Michel. Although the timing is different, for all practical purposes the Olin/Michel bill yields essentially the same results as the bill developed by Senators Leahy and Helms. (If the Hawkins amendment to the Leahy-Helms bill is approved, the Senate bill will be virtually identical to the Olin/Michel bill.) A simple price cutting proposal modeled after the Olin/Michel bill is the second alternative analysed herein.

This approach calls for a \$0.50 reduction on January 1, 1986 if net removals for the following 12 months are projected to exceed 10 billion pounds, M.E. If net removals are projected to exceed 5 billion pounds for the 12 months following October 1, 1986, then the support price may be reduced another \$0.50. At the beginning of each successive fiscal year, the Secretary of Agriculture must estimate net removals for the next 12 months based on the current support price. If projected net removals exceed 5 billion pounds, he must reduce the support price \$0.50. If net removals are estimated to exceed 10 billion pounds, he must reduce the price \$1. There is no provision for a diversion program of any type; there are no changes in federal order prices.

### The Combination Approach (C)

A combination of price cuts and a whole herd buy-out program has been suggested as a possible compromise between those who have favored price cuts and those who prefer voluntary supply controls. The final alternative combines the price adjusting rules of the price cutting proposal with the herd buy-out component of H.R. 2100. This approach would permit reductions in the support price of 50 cents per cwt when net removals would otherwise be projected to exceed five billion pounds. In years when a reduced price was projected to be insufficient to hold net removals to no more than five billion pounds, the Secretary of Agriculture would be authorized to offer a voluntary whole herd buy-out program. As is generally true under H.R. 2100, the buy-out program would be offered on a bid-basis and those who participated in the program would be expected to liquidate their herd and desist from producing milk for three years.

### Estimated Support Prices and Program Effects

The three program proposals were analyzed by computer simulation using a common set of assumptions. Results of this analysis are shown in the following tables. Clearly a different set of assumptions would alter these results. The assumptions that were made are believed to be reasonable with respect to increases in commercial disappearance and production. Additional comments relative to assumptions are made later in the text, as appropriate, and further details are provided in Appendix B.

It should be noted that the support prices which result from these alternative policies can not be estimated with certainty. The H.R. 2100 or

"H" prices will rise and fall with the "cost of production index". It is a virtual certainty that prices under H won't decrease, but they could increase at a slightly different rate. The rate of change in these prices is linked to changes in the cost of production index and (to a lesser extent) production per cow. This analysis assumes that feed price, the largest single component of the index, is constant over the next five years, while all other prices increase about four percent. If feed price does increase, for example, supports would be even higher. However, if feed price decreases it will only slow the increase in the support price.

The price-cut approach or "S" and the compromise or "C" prices are far more certain, but they will vary with estimated supply and demand. If commercial disappearance proved to be considerably higher and/or production fell considerably lower, such that net removals decreased significantly, the S and C support prices could be somewhat higher. However, very optimistic assumptions are required to prevent the support price from falling. In fact, if one is more pessimistic about demand and/or supply growth, price could go lower.

One of the larger challenges of this analysis is to estimate how the tandem diversion program permitted under H.R. 2100 would work and what its impact would be. A number of assumptions have been made. First, it is assumed that the Secretary will use five billion pounds as a target for net removals. Second, the sign-up for the diversion program(s) is assumed to be sufficiently large to enable the Secretary to use the 100% buy-out offers to meet the net removals target and thereby permit him to reduce all 5-30% diversions to the minimum 5%, at which point producers rescind virtually all of the 5% contracts. It is further reasoned that the buy-out offers are bid at less than \$10, the payment under the 5-30% option. It is assumed that the average bid in the first year is \$8; and that the bids increase slightly in succeeding years. (This assumption is supported by the preliminary work of Casler. Casler calculates from Cornell's farm business management summary data, that the average farmer in that sample would be able to bid from four to nine dollars for a three-year diversion commitment.)

Under the provisions of H.R. 2100, a producer bidding an \$8 buy-out contract agrees to cease milk production for three years; in return the producer receives \$4 per cwt for the first two years of the contract. Thus the annual cost is much less than \$10 in the first two years and is zero in the third year. In the fourth year, the initial participants are free to resume dairy farming, but it is (arbitrarily) assumed that 90% of the milk stays out of the marketing system. Even with this assumption, it becomes necessary to buy-out more and more milk every year; because the price of milk is constantly pushed up by the pricing formula.

Similar assumptions are made relative to the buy-out program hypothesized under the combination approach (C). The only difference is that it is assumed that more of the program participants stay out of dairy farming after their commitment expires (95% of the milk instead of 90%). This marginally greater carry-over effect is supported by the relatively lower farm prices under C compared to H.



### Producer Effects

The farm level impacts of the alternative dairy policies outlined above are shown in Table 1. The all milk price essentially follows the support price set under each scenario (cf. Table 3), although market prices are assumed to increase relative to the support price as net removals decrease (reflecting tighter supplies and a more competitive market). Under H.R. 2100 (H), the all milk price increases about 80 cents per cwt over the next four fiscal years. This is partially offset by milk marketing deductions that range from 11 cents to 30 cents. The price reduction plan (S) results in a 52 cent reduction in price in 1987, followed by 36 cent declines in 1989 and 1990. With a combination of price cuts and a buy-out program (C), prices intermediate to the other two approaches result. After an initial price cut, the all milk price stabilizes around the level of \$11.75 to 11.80 between FY 1987 and 1990. By 1989, this is a full dollar higher than the price which is projected under the purely price cut approach.

An estimated milk:feed price ratio (M:F) is shown as an approximate measure of the profitability of milk production. The ratio shown deducts assessments from H and C milk prices and assumes that the price of 16% dairy ration remains constant at about its current level, \$8.50 per cwt. (\$170 per ton). Under H, the M:F increases with the (net) all milk price, rising from 1.48 to 1.59. This clearly indicates conditions would be very favorable to milk production based on historical standards. The M:F under S starts at 1.41, slightly below the level under H, but drops consistently each year until it hits 1.26 in 1989. Thus this price cutting approach starts at an historically favorable level and in three years moves to a level that historically has been associated with significant reductions in milk production. Following the respective price changes, the combination (C) approach results in a fairly stable M:F, holding around 1.40. At this level, some stimulus to production is expected, but considerably less than that associated with the rising prices under H.

Milk production is estimated to drop to 134.5 billion pounds in FY 1986 and rise to over 136 billion pounds in FY 1989, under H. This slight increase essentially follows growth in commercial disappearance (cf. Table 2) as net removals are tailored to five billion pounds by the diversion program (cf. Table 3). Under S, milk production stays around 141 billion pounds, slowly dropping in FY 1986 and FY 1987 and then rising slightly through FY 1990. Milk production in FY 1986 drops to 135.5 billion pounds under C, a billion pounds higher than the level under H. In future years production is estimated to increase, approaching the higher production levels associated with the pure price cut plan (S).

Cash receipts from dairying are considerably higher under H, totalling \$70 billion over the next four fiscal years. Under S and C cash receipts total \$61.9 and 63.3 billion, respectively. Under H, cash receipts rise every year, but with the price cutting approach (S) they fall. Under C, price falls until it stabilizes in FY 1987.

### Consumer Effects

Retail prices generally move with the farm price of milk, as shown in Table 2. Although the model used to calculate these changes assumes that retail prices do not fully reflect decreases in farm prices, retail prices are estimated to be lower than current levels in all years under S and C and during the first two years of H. Compared to FY 1985 levels, retail prices in FY 1990 are 1% higher under H, 8% lower under S, and 5% lower under C. As with the farm milk price under H, after an initial drop in FY 1986 retail price increases steadily throughout the next four years. The opposite occurs with the price cut approach (S) and an intermediate price level results under C. In all scenarios, some exogenous growth in commercial disappearance is assumed. Hence, even under H.R. 2100, commercial disappearance grows 3.3% from FY 1985 to FY 1990. Under S and C, commercial disappearance is estimated to grow 7.4% and 6.0%, respectively.

### Government Effects

The effects of these policies on net removals and expenditures are shown in Table 3, along with the estimated support prices. Net removals under H average five billion pounds (M.E.) per year. Contracted diversions under the buy-out option begin at 8.5 billion pounds for FY 1986. Additional reductions are required in each of the following years bringing the total up to 11.9 billion in FY 1988, but the total cost is low that year because most of it has already been paid for. The contracted buy-out drops to 5.6 billion pounds in FY 1989 because the first contracts have expired but they have a significant carry-over effect.

The situation is considerably different under the price cutting approach (S), net removals are estimated to start high but move to low levels. In FY 1986, net removals are estimated at 10.9 billion pounds, the highest figure in any year under either of these programs. By FY 1989, net removals fall to 3.9 billion pounds.

The combination of price cuts and buy-outs (C), results in a quick reduction in net removals in FY 1986 and further (price induced) cuts in FY 1987. After FY 1987, net removals are estimated to increase slightly; however they remain low enough that they do not necessitate either further price cuts or buy-outs. Depending on exogenous changes in supply and demand, further price cuts after FY 1989 may or may not be needed; it appears unlikely that additional buy-outs would be warranted.

The final figure that is shown reflects government expenditures. The variable listed in Table 3 as "purchase cost" refers to the cost of purchasing cheese, butter, and nonfat dry milk plus any diversion payments less any marketing assessment revenue. The estimated cost of acquiring dairy products is a rough approximation. Actual costs have varied considerably (e.g. several \$/cwt.) when calculated on a dollars per cwt. of M.E. basis. Diversion payments include accruals for the final quarter that are actually disbursed in the following fiscal year. Other miscellaneous expenses and incomes are ignored altogether. In many years those miscellaneous items net quite close to zero but in any given year could be positive or negative depending on (noncommercial) sales of stocks, carrying costs, etc. Based

on recent expenditure trends, the formula used to calculate purchase costs here should differ from actual costs by a fairly small amount; there is a high probability that underestimates would be less than \$100 million or so. (This does not include differences due to the accounting for accrued diversion payments.)

The government share of program costs under H averages \$809 million and is fairly constant over the next five years. The producers' share of program costs averages \$273 million, with larger amounts during the first two years of the bill.

Purchase costs under the price cutting plan (S) parallel net removals. They start high (\$1.6 billion) and end low (\$.6 billion).

Purchase costs under C drop to about the same level in FY 1986 as under H, but then fall quickly to about \$.5 billion in FY 1987. Thereafter, purchase costs rise slightly but remain below the lowest level attained under S. Producer costs are about half those under H, averaging slightly less during the first two years and then going to zero thereafter.

#### Federal Order Prices

This analysis assumed class I prices will average 30 cents per cwt higher under the the provisions of H.R. 2100 (H); however the federal order changes were not subjected to any thorough analysis. It is difficult to assess the aggregate national or regional implications of the proposed changes in federal order prices. It is much harder to simulate the effects of permitting reimbursements for market-wide services, at least until more details are flushed out. Nonetheless the federal order changes contained in H.R.2100 are potentially very important.

#### Conclusions

The pricing formula as currently structured under H.R. 2100 virtually guarantees that a diversion and assessment program will be necessary to cap net removals and government costs. Even with an assessment, H results in higher cash receipts to farmers, however consumers pay for much of this in the form of higher prices and consumption suffers in turn. As reflected in the results under C and based on what occurred under the last Milk Diversion Program, the buy-out option may well prove to be a considerably cheaper and less ephemeral way to manage supplies than the 5-30% diversion. To what degree this is true can not be accurately forecasted. Nevertheless it is certain that with milk prices inexorably rising, it will be impossible to bring supply and demand into balance without some kind of supply control program.

The analysis of the pure price cut approach (S) confirms what many dairy industry analysts have speculated. Support prices would have to fall to about \$10 per cwt in order to get net removals and budget costs to low levels. As mentioned earlier, the price cuts could be smaller if demand grows more rapidly than assumed here (cf. Table 2) or if supply grows less rapidly (cf. Table 1). The reverse is also true. Production and consump-

tion data for 1985 will be important indicators of what can happen when support prices are reduced. The evidence so far is not encouraging. Although commercial use appears to be up, production is also up considerably since the first quarter of 1985. How long this rate of increase in production can be maintained remains to be seen, but with today's low feed prices a significant change in production does not seem to be imminent. A price solution means more substantial cuts in the support price.

The combination of price cuts and a buy-out program represents an intermediate position in all respects. Prices fall for the first two years, but then stabilize. Net removals are quickly reduced and average lower than either of the other two alternatives. Government expenditures, with the help of a modest farmer assessment in the first two years, are held significantly lower than they are under the other programs. Consumers benefit considerably compared to the H results, although they fair slightly better with the more severe price cuts under S.

Table 1. Estimated Effects of Alternative Dairy Policies on Farm Level Markets

	1985 <sup>a</sup>	1986	1987	1988	1989
All Milk Price (\$/cwt.)	12.99				
H		12.88	13.09	13.41	13.69
S		11.97	11.45	11.09	10.73
C		12.32	11.83	11.75	11.74
Marketing Assessment (\$/cwt.)	.25				
H		.26	.30	.11	.15
S		0	0	0	0
C		.20	.20	0	0
Milk:Feed Price Ratio <sup>b</sup>	1.50				
H		1.48	1.50	1.56	1.59
S		1.41	1.35	1.30	1.26
C		1.43	1.37	1.38	1.38
Milk Production (bil. lbs.)	138.8				
H		134.5	135.2	135.7	136.3
S		141.2	141.0	140.9	140.5
C		135.5	135.7	137.4	139.0
Cash Receipts (bil. \$)	17.5				
H		16.8	17.3	17.7	18.2
S		16.4	15.7	15.2	14.6
C		16.2	15.6	15.7	15.8
Producers' Surplus (bil. \$) <sup>c</sup>	14.9				
H		14.6	15.1	16.0	16.5
S		13.8	13.2	12.8	12.4
C		14.0	13.4	13.7	13.9

<sup>a</sup> based on USDA forecasts

<sup>b</sup> price of 16% dairy ration assumed to stay constant at \$8.50 per cwt.; includes assessments under H.R. 2100

<sup>c</sup> an approximate measure of producer welfare; based on shifts in supply functions as well as price changes.

Table 2. Estimated Effects of Alternative Dairy Policies  
On Retail Level Markets

	1985 <sup>a</sup>	1986	1987	1988	1989
Ave. Retail Price (\$/cwt. M.E.)	27.05				
H		26.55	26.76	27.06	27.32
S		26.06	25.60	25.22	24.84
C		26.15	25.69	25.66	25.66
Comm. Disappearance (bil. lbs.)	127.6				
H		130.0	130.7	131.2	131.8
S		130.8	133.0	135.0	137.1
C		130.7	132.9	134.1	135.3
Consumer Expenditures (bil. \$)	34.5				
H		34.5	35.0	35.5	36.0
S		34.1	34.0	34.1	34.1
C		34.2	34.2	34.4	34.7
Consumers' Surplus (bil. \$) <sup>b</sup>	15.0				
H		15.7	15.6	15.3	15.1
S		16.3	17.1	17.7	18.3
C		16.2	16.9	17.1	17.3

<sup>a</sup> based on USDA forecasts

<sup>b</sup> an approximate measure of consumer welfare; based on shifts in demand functions as well as price changes

Table 3. Estimated Effects of Alternative Dairy Policies  
On Government and Taxpayers

	1985 <sup>a</sup>	1986	1987	1988	1989
Support Price (\$/cwt.)	12.23				
H		11.67	11.89	12.21	12.50
S		11.23	10.60	10.10	9.60
C		11.23	10.60	10.60	10.60
Net Removals (bil. lbs. M.E.)	11.4				
H		5.0	5.0	5.0	5.0
S		10.9	8.5	6.4	3.9
C		5.3	3.3	3.8	4.3
Diversion Sign-Up (bil. lbs.) <sup>b</sup>	4.2				
H		8.5	9.8	11.9	5.6 <sup>c</sup>
S		0	0	0	0
C		6.3	6.3	6.3	0.0 <sup>d</sup>
Purchase Cost (mil. \$) <sup>e</sup>	1765.8				
H		806.5	822.1	790.0	819.3
S		1552.4	1164.7	838.8	589.5
C		796.4	492.2	517.8	581.8

<sup>a</sup> based on USDA forecasts

<sup>b</sup> estimated contracted diversion, assumes 5% lower effective diversion under both H and C.

<sup>c</sup> assumes 90% of original 8.5 billion pound contracted diversion remains out of production

<sup>d</sup> assumes 95% of original 6.3 billion pound contracted diversion remains out of production

<sup>e</sup> includes an estimate of the cost of acquiring cheese, butter, and nonfat dry milk plus diversion payments less assessment revenue, does not include storage or other carrying costs, restricted sales for dollars, or other miscellaneous items

## APPENDIX A

An Outline of the Provisions of the Dairy Unit Act  
(Title II of H.R. 2100)

## A. Milk Price Support and Producer Supported Dairy Diversion

Section 211 - Setting Support Price

- every October 1
  - "cost of production" (dairy parity)  
1976-78 base period  
\$8.83 base price
  - productivity adjuster
    - to make prices paid index approximate cost (production per cow) for year ending last June 30  
11,101 pounds per cow is the base level
  - supply/demand adjuster
    - change preliminary support price according to net removals
- Note: Even with downward adjustment, new price could be higher than old

Section 212 - Milk Diversion Program

- if USDA estimates net removals less imports (2.5 - 3 billion pounds) at new price will be:
- 5 to 7 billion pounds then Secretary may use MDP
- 7 billion pounds then Secretary must use MDP
- MDP must be accepted up to the point where net removals would be 4 billion pounds
- must simultaneously offer two options:

## Reduced Production Program (RPP)

- same as old MDP, 5 - 30% voluntary reduction
- must run through 9/30/87, o.w. annual contracts can be reduced if sign-up is too big
- producer can rescind reduced contract

## Production Termination Program (PTP)

- new "buyout", no milk sales
  - offer and accept on bid basis
  - sell all dairy cattle
  - producer or facility may not produce milk for 3-5 years, number of years to be specified by Secretary before sign-up starts
- base period
    - normally July to June
    - if under old MDP may be old base + 2.2%
  - phased in culling
  - \$5,000 penalty if buyer fails to slaughter
  - begin 30 days after enactment
  - sign-up ends 60 days after enactment

Assessment is based on:

- if a MDP is offered, USDA can collect assessment based on cost of net removals in excess of 5 billion pounds
- cost of MDP
- \$100 million over two years for Dairy Research Endowment
- USDA must refund with interest if it collects too much

Section 214 - Adverse Effect on Red Meats

- if a MDP is offered, Secretary must buy additional 250 million pounds of red meat for distribution

Section 215 - Casein

- USDA must study casein impacts and report to Congress no later than 60 days after enactment
- at least 1 million pounds of nonfat dry milk offered by CCC annually to bidders who will convert it to casein in a U.S. plant

Section 216 - Congressional Evaluation of COP

- 2 years after enactment, House and Senate agricultural committees must report study of composition and performance of the new "COP" index

B. Dairy Research and Promotion

- establish Dairy Research Endowment
- \$100 million collected over two years
- funded by producer assessment if there is a MDP assessment, otherwise CCC funds it
- importers must pay to Endowment and National Dairy Board but they also get one member on Board
- administered by National Dairy Board

C. Milk Marketing Orders

Section 231 - Adjusted Class I Differentials

- increase differentials in 35 of 44 orders
- weighted average increase is about 30 cents
- in effect for at least two years from date of enactment, change by normal order hearing process thereafter

Section 232 - Continue Seasonal Plans

Section 234 - Marketwide Service Payments

- payments may be made from order "pool" to pay coops for marketwide services such as: seasonal and daily balancing

D. National Dairy Commission

- "to respond to the development of new technologies in the domestic milk production industry by reviewing the support program and alternatives...to prevent large surplus while ensuring preservation of small and medium sized family farms"



- 18 producers appointed by Secretary with 12 from nominations by ranking Republican and Democrat on House and Senate agricultural committees
- submit report by March 31, 1987

E. Miscellaneous

Section 251 - Extend Transfer of Dairy Products to Military and VA Hospitals

Section 252 - Extend Dairy Indemnity Program

## APPENDIX B

## Analytical Assumptions

Numerous assumptions are explicit or implicit in this analysis. Many of the implicit assumptions are wrapped up in the simulation model. A detailed discussion of the model is provided elsewhere here.<sup>1</sup> Important components of that model are the price elasticities of supply and demand, which are shown in Table B1.

Table B1. Assumed Price Elasticities of Supply and Demand

Demand/Supply	Own Price Elasticity
Demand	
Fluid Products	-.2
Non-supported Mfd. Products	-.4
Supported Mfd. Products	-.5
Supply	
Grade A Milk	.2
Grade B Milk	.2

<sup>1</sup> Andrew M. Novakovic, A Detailed Description of a Comparative Studies Model of the U.S. Dairy Sector, A.E. Res., forthcoming, Dept. of Agr. Econ., Cornell University.

Certain other exogenous factors are estimated as shown in Table B2.

Table B2. Assumed Levels of Exogenous Variables

Variable	1986	1987	1988	1989
Farm Use (bil. lbs.)	2.3	2.3	2.3	2.3
Commercial Stocks		constant		
Imports		constant		
USDA Make Allowance		constant		
M-W Price Minus Support Price (¢/cwt.)				
H	20	20	20	20
S	-11	0	13	27
C	20	34	27	27
16% Dairy Concentrate (\$/cwt.)	8.50	8.50	8.50	8.50

Finally, exogenous shifts in demand and supply are assumed. These shifts are somewhat arbitrarily derived but are consistent with recent trends. Demand and supply shifts represent the net effect of changes in population, prices of substitutes, incomes, etc. on the demand side and changes in prices of inputs, technological change, etc. on the supply side. As shown in Table B3, identical demand shifts are assumed for all price support scenarios but supply shifts are lower when a diversion program is in effect or when the milk:feed price ratio reaches low levels by historical standards.

Table B3. Exogenous Shifts in Supply and Demand

Demand/Supply	Rightward Shift/Increase			
	1986	1987	1988	1989
	(percent)			
Demand				
Fluid Products	.1	.1	.1	.1
Non-supported Mfd. Products	1.0	1.0	1.0	1.0
Supported Mfd. Products	1.5	1.5	1.5	1.5
Supply				
Grade A Milk				
H	1.0	1.0	1.0	1.0
S	1.0	.8	.6	.4
C	1.0	1.0	1.0	1.0
Grade B Milk				
H	.7	.7	.7	.7
S	.7	.6	.4	.25
C	.7	.7	.7	.7