

pendent plants. Twenty-five percent of the milk processed by independent plants is sold to integrated retailers and 65 percent to independent retailers. Allocation two is similar to one except that only 65 percent of the milk produced is handled by independent plants all of which is sold to independent retailers. In allocation three a distinction is made between large and medium-to-small integrated processor-retailers. Allocation four is similar to three except that only 40 percent of the milk produced is handled by independent plants all of which is sold to independent retailers. Table 4 gives the per unit costs of processing and distributing Class I and II milk under each product allocation and efficiency level. These costs were used in the processing segment of the integration model. The mathematical formulation of the integration model is discussed in Appendix D.

Results

Since the cost adjustments and product allocations specified for the integration model do not affect the producer and retail segments of the basic model, returns to producer and retailers do not vary with the allocation or efficiency level. However, the rate of production and farm prices do affect the level of net returns to processors. The processor segment for each of the four allocations and three levels of efficiency was run with the producer and retail segments of the basic and cooperative models. Processor net returns for these runs are reported in Table 5.

Processor net returns under all four allocations and three efficiency levels are greater for the cooperative-integration than the basic-integration model. This result reflects the higher milk production rate in the cooperative model than in the basic model. For the basic and cooperative integration models, processor net returns increase from allocation one to allocation four and from efficiency I to III. This illustrates two points. First, as the proportion of milk handled by integrated plants increases, total processor net returns increase for every level of efficiency. Second, the greater the cost reductions due to integration, the greater the increase in processor net returns. Changes in net returns are quite sensitive to product allocation and the level of efficiency. Table 5 shows the trade-offs for increasing processor net returns by increasing the extent of integration (moving from structure one to structure four) versus increasing the efficiency of integrated plants (moving from efficiency I to III).