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Report to the Chairman, Committee on the Budget, House of Representatives

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# FOOD ASSISTANCE

# Information on WIC Sole-Source Rebates and Infant Formula Prices

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GAO

**United States**
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**Resources, Community, and**
**Economic Development Division**

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May 11, 1998

The Honorable John R. Kasich
Chairman, Committee on the Budget
House of Representatives

Dear Mr. Chairman:

Established in 1972, the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) provides federal grants to the states for food, health care referrals, and nutrition education for low-income pregnant and postpartum women, infants, and young children. The U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) administers WIC in conjunction with state and local health departments and related agencies. Typically, participants receive food benefits in the form of vouchers that they redeem at authorized retail vendors to obtain, at no cost to the participants, certain approved foods, including infant formula. Then, on the basis of the redeemed vouchers, the state WIC agencies reimburse the retail vendors for the food sold to the WIC participants. In fiscal year 1997, an average of 7.4 million people—including about 1.9 million infants—participated in the program. These infants receiving WIC benefits accounted for about 46 percent of all infants born in the United States in 1996. Because of the large percentage of infants enrolled in the program, WIC purchases of infant formula, according to industry estimates, account for over 50 percent of this product's sales in the United States. During the 1980s, as WIC participation grew and the price of infant formula rose, infant formula became a large and growing portion of WIC costs.

In 1989, the states were required by law to implement measures to contain the cost of infant formula.[1] These measures have primarily taken the form of state programs that award a contract to a manufacturer for the exclusive right to sell its infant formula to WIC participants.[2] These sole-source contracts are awarded on the basis of competitive bids. Under current statutory authority, the firm offering the lowest net price

[1]P.L. 101-147 (Nov. 10, 1989). Under the law, state agencies are required to procure infant formula using a competitive bidding system or an alternative method of cost containment that yields savings equal to or greater than those produced by a competitive bidding system. Some states had voluntarily negotiated sole-source contracts with infant formula manufacturers before the sole-source rebate requirement went into effect.

[2]Some groups of states jointly have contracted for a sole-source provider of infant formula. Therefore, the geographic area covered by some contracts may be larger than a single state.

(wholesale price minus rebate) wins the WIC contract.[3] The contract-winning manufacturer is then billed by state WIC agencies for rebates on all infant formula purchased by WIC participants with vouchers at authorized retail outlets. The competitive bidding process has resulted in significant rebates to state WIC agencies for infant formula, dramatically reducing their costs. As a result, rebates have divided the market for infant formula into a discount market segment (the WIC market with rebates) and a standard market segment (the non-WIC market).

You asked us to provide information about several issues related to rebates for infant formula. Specifically, this report discusses (1) how prices in the infant formula market changed for non-WIC purchasers and WIC agencies after the introduction of sole-source rebates, (2) how key characteristics of the infant formula market may contribute to the size of the rebates offered by manufacturers, (3) whether there is any evidence indicating that non-WIC purchasers of infant formula subsidized WIC purchases through the prices they paid, and (4) whether the significant cost savings WIC agencies have achieved by using sole-source rebates for infant formula have implications for the use of rebates for other WIC products.

## Results in Brief

At about the time the WIC rebate requirement went into effect in 1989, the wholesale prices paid by non-WIC purchasers rose faster than usual while the net prices paid by WIC agencies decreased. Wholesale prices for non-WIC purchasers rose an average of 9 percent annually after adjusting for the general rate of inflation in the economy at about the time the sole-source rebate requirement went into effect, compared with increases of about 3 percent at other times during the period of our analysis. Since little data are available on the factors that could have affected the price of infant formula, we could not analyze the extent to which, if at all, the accelerated price rise in infant formula was due to the rebate requirement. WIC agencies, which paid the same price as non-WIC purchasers between 1982 and 1989, paid significantly less for infant formula after the rebate requirement was implemented in 1989. After accounting for rebates in 1996, for example, WIC agencies paid, on average, 85-percent less than the wholesale price for infant formula.

Key characteristics of the infant formula market are the likely reason that manufacturers are able to offer WIC agencies significant rebates. In

[3]P.L. 105-86 (Nov. 18, 1997). The state must award the contract to the firm offering the lowest net price, unless the weighted average retail price for different brands of infant formula in the state can be shown to vary by less than 5 percent.

particular, the method of marketing infant formula—through physicians' recommendations—contributes to strong brand loyalty among parents. In addition, only a small number of firms—currently, three major producers—sell infant formula. These characteristics are often associated with market prices that are high relative to the costs of production, indicating the likelihood of high profit margins and making high rebates possible. However, the nature of the market is changing because a new firm has entered—Carnation—that is offering infant formula at significantly lower wholesale prices.

Although we did not have access to the price and cost data that could determine definitively whether non-WIC consumers subsidized WIC through the prices they paid for infant formula, our analysis indicates that it is doubtful that such a subsidy has occurred. In economic terms, a subsidy would occur if a manufacturer sold formula to WIC agencies for less than its cost of production and the price paid by non-WIC purchasers compensated for this loss. Although prices have differed substantially between the WIC and non-WIC markets, available evidence indicates that manufacturers are still covering their production costs in the WIC market. Furthermore, it is unlikely that manufacturers would have an incentive to sell formula at a loss to over 50 percent of the market—the share accounted for by WIC.

Rebates for other food products purchased by WIC can help reduce the program's costs but probably will not generate the level of savings generated by infant formula rebates. Savings for other products would be lower than for infant formula in part because no other single product accounts for as large a portion of WIC costs as infant formula and because the market characteristics of other products make it likely that manufacturers would offer smaller rebates per item. Ultimately, the states may find that other cost-reducing options are more effective than rebates in generating savings for some WIC foods other than infant formula.

## Background

For the first several months of life, breast milk or infant formula is the primary item in a baby's diet. The content and quality of infant formula is strictly regulated by the Food and Drug Administration for all brands. Therefore, milk-based or soy-based infant formula is nutritionally identical among brands. Three major manufacturers currently supply most of the

infant formula sold in the U.S. market.[4] Two of these three companies are subsidiaries of pharmaceutical companies and primarily market their infant formula through endorsements from the medical establishment—physicians and hospitals—rather than through direct advertisement to consumers. This marketing process is referred to as medical detailing. Carnation, which effectively entered the infant formula market in the United States in 1990, markets infant formula directly to consumers through mass advertising.[5] Currently, Carnation has the smallest market share of any major producer.

To qualify for participation in WIC, applicants must be at nutritional risk and have an income of no more than 185 percent of the poverty level.[6] The supplemental foods that WIC provides include infant formula, milk, cheese, fruit and vegetable juices, iron-fortified adult and infant cereals, dried beans or peas, peanut butter, and eggs, as well as carrots and tuna fish for breast-feeding participants. Typically, participants receive their food benefits in the form of a check or a voucher that is used to purchase the specific foods at authorized retail vendors. Each state designates the types and amounts of foods that local WIC agencies can prescribe to meet participants' nutritional needs.

WIC operates in the 50 states (as well as on 33 Indian reservations), the District of Columbia, Guam, the U.S. Virgin Islands, American Samoa, and the Commonwealth of Puerto Rico. The program is primarily funded by federal appropriations, but some states supplement the federal grant with their own funds. In fiscal year 1996, WIC's estimated expenditures for food were $2.7 billion, of which $578 million (net expenditures after rebates) was spent for infant formula. The rebates for infant formula totaled about $1.2 billion, lowering WIC food costs so that WIC agencies could provide benefits to approximately 1.7 million additional WIC participants monthly.

[4]These companies are Mead Johnson Nutritionals (Bristol-Meyers Squibb), Ross Laboratories (Abbott Laboratories), and Carnation (Nestlé Corporation). Wyeth-Ayerst Laboratories (American Home Products Corporation) announced in 1996 that it would stop producing infant formula under its own name for the domestic market. It has recently begun to produce infant formula sold under store labels.

[5]Carnation received the Food and Drug Administration's approval for its infant formula late in 1988. It took some time, however, before the company's presence was felt in the market. Carnation infant formula was approved by WIC in 1989, and the first wholesale price quote available to us was for 1990.

[6]States may set an income threshold lower than 185 percent, provided it is not set below 100 percent of the poverty level. In 1997, for example, the annual WIC income limit for a family of four was $29,693 in the 48 contiguous states and the District of Columbia. Poverty guidelines are established separately for Alaska and Hawaii.

## Prices Paid by Non-WIC Purchasers Rose Faster Than Usual When Rebate Requirement Went Into Effect

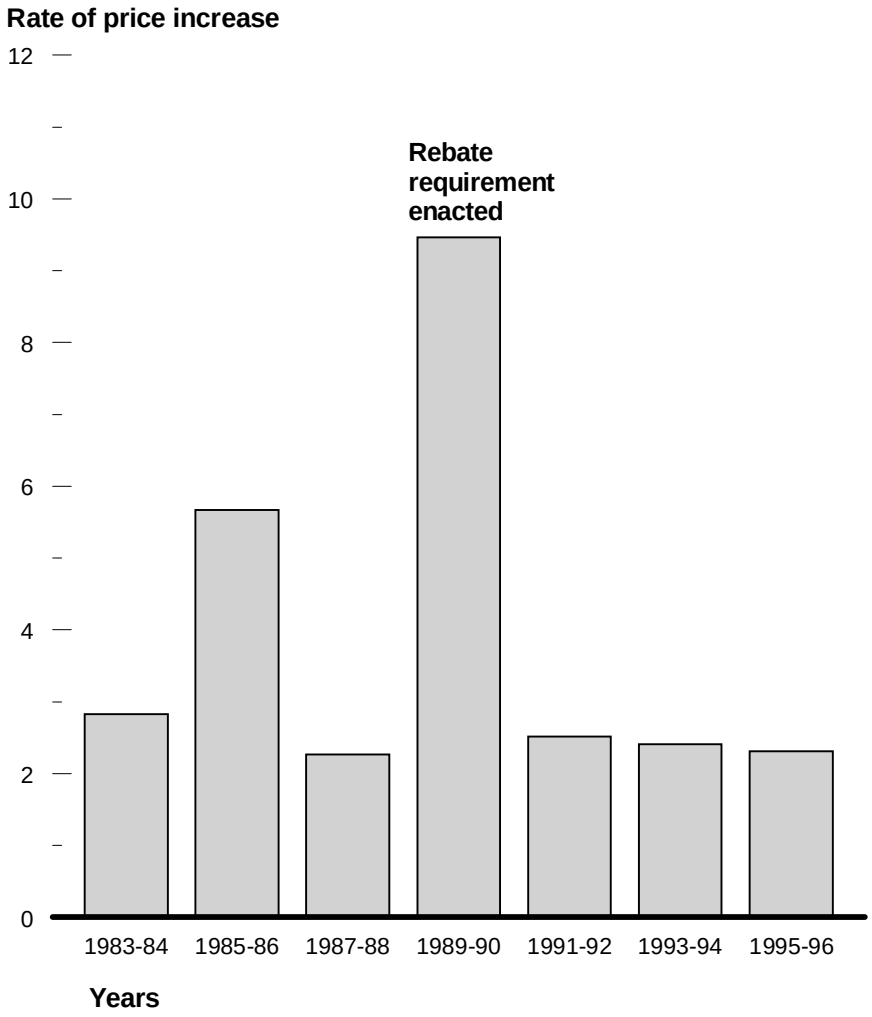
Wholesale infant formula prices rose steadily from 1982 to 1996. Prices increased at a faster rate, however, at about the time the federal requirement for infant formula rebates first took effect in 1989—rising 9 percentage points above the general rate of inflation in the economy in this period compared with increases of about 3 percentage points above inflation, on average, at other times.[7] Since little data are available on the factors that could have affected the price of infant formula, we could not analyze the extent to which, if at all, the accelerated price rise in infant formula was due to the rebate requirement. For WIC agencies, which had previously paid the same price as non-WIC purchasers, the net prices paid for infant formula decreased significantly after rebates went into effect. WIC agencies, for example, paid 85 percent less, on average, than the wholesale price for infant formula after accounting for rebates in 1996.

### Prices for Infant Formula Increased Fastest After Rebates Introduced

Average wholesale prices for infant formula increased every year from 1982 through 1996. They increased fastest, however, at about the time the rebate requirement first came into effect—peaking at 9 percentage points above the general rate of inflation in the economy, as shown in figure 1.

[7]Wholesale prices represent approximately the amount non-WIC purchasers pay for infant formula. The actual price paid is the retail price, which is typically higher than the wholesale price by the amount of the retailer's markup. Because data on retail prices were not readily available, this report focuses on wholesale prices for the product.

**Figure 1: Rate of Increase in Prices for Infant Formula, Adjusted for Inflation, 1983-96**




Note: The rate of price increase in the figure is the average annual rate of increase above inflation.

Source: GAO's analysis of infant formula prices.

Because little data are available on the factors that could have affected the price of infant formula, we could not analyze the extent to which, if at all, the accelerated price rise in infant formula was due to the rebate

requirement.[8] Nevertheless, using available information, we analyzed whether the WIC rebate requirement for infant formula could have caused the acceleration in infant formula prices for non-WIC purchasers. These wholesale prices could have risen as a result of the WIC rebate requirement if, for example, the demand for a particular infant formula increased in the non-WIC market simply because the manufacturer of that formula won the WIC contract. We asked experts on the infant formula market whether any such "spillover" effect occurred.[9] According to these experts, this spillover effect could have happened if (1) a WIC contract enabled a firm to obtain increased shelf space at grocery stores and hence increased sales to non-WIC purchasers and/or (2) physicians were more likely to recommend the contract-winning formula to their non-WIC patients. While such occurrences cannot be ruled out, the rapid price increase for infant formula that occurred at the time the rebate requirement went into effect could also be due to a host of other unmeasurable market factors. Such factors could include, for example, an increase in the cost of producing infant formula or changes in the demand for the product.[10]

## Net Prices for Infant Formula Sold to WIC Agencies Fell Significantly With Introduction of Rebate Requirement

The prices WIC agencies paid for infant formula decreased significantly after the rebate requirement went into effect in 1989. Before 1989, most WIC agencies generally paid the same prices as non-WIC purchasers for infant formula. With the rebate requirement, the price WIC agencies paid was basically the wholesale price of the formula minus the rebate offered by the contract-winning manufacturer. Figure 2 shows the national average wholesale price, average WIC rebate, and resulting average WIC net price from 1989 through 1996. As indicated by the figure, the average wholesale price in 1996, for example, was $2.48 per can.[11] Manufacturers sold infant formula to WIC agencies, however, for about $0.38 per can.

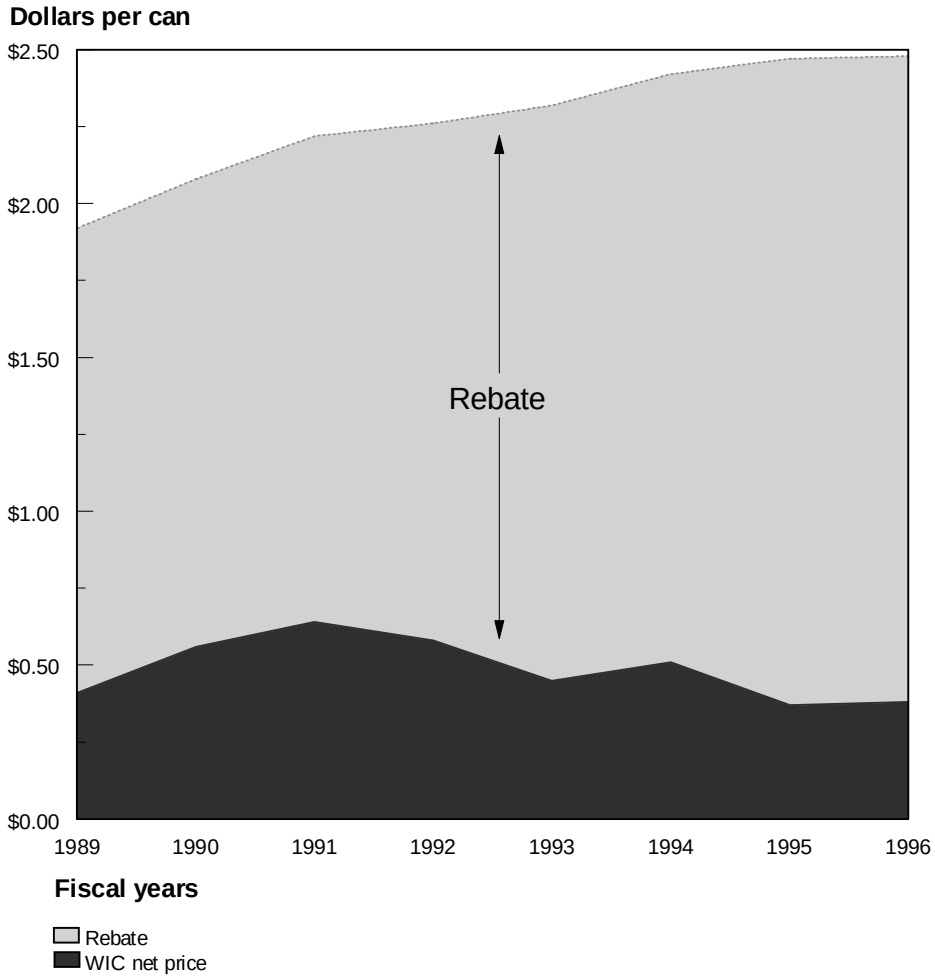
[8]We contacted the three major manufacturers of infant formula currently producing infant formula, as well as the manufacturer that left the market as a brand producer in 1996. Three of the firms responded to our requests but would not discuss the prices or price changes for their products.

[9]These experts included representatives of infant formula companies, university professors, and consultants.

[10]In fact, the structure of demand in this market may have changed throughout recent years because of a dramatic increase in the number of infants enrolled in WIC. From 1982 through 1996, the percentage of infants in WIC grew from 18 percent of infants born in the United States to 46 percent. As lower-income women were drawn into WIC and the non-WIC market became composed of higher-income consumers, economic principles would suggest that, other things being held constant, prices of formula for non-WIC consumers would rise.

[11]We used 13-ounce cans of infant formula concentrate as the unit of our analysis.

**Figure 2: Average Infant Formula Wholesale Price, Rebate, and Net WIC Price, 1989-96**




Source: GAO's analysis of infant formula prices.

As the figure also shows, these rebates have been substantial and have been increasing over time. USDA estimated that, in 1996, over $1.2 billion in savings to WIC resulted from rebates for infant formula. These savings enabled the states to enroll 1.7 million more participants in WIC.

## Key Characteristics of Infant Formula Market May Have Contributed to High Rebates

Key characteristics of the infant formula market are the likely reason that manufacturers are able to offer WIC agencies significant rebates. In particular, the wholesale prices of infant formula appear to be high in relation to the cost of production—indicating the likelihood of high profit margins and the associated possibility of significant rebates. However, the nature of the market is changing because a new firm has entered the market—Carnation—that is offering infant formula at significantly lower wholesale prices.

Our analysis indicates that manufacturers are able to offer WIC agencies significant rebates because a number of key characteristics of the infant formula market may lead to high prices relative to the costs of production. First, consumers of infant formula are probably not very responsive to changes in prices for infant formula. In particular, because many parents rely on a physician's recommendation for a specific brand of infant formula, they are likely to be reluctant to change brands, even though infant formula is nutritionally identical across brands and the price of an alternate brand may be significantly lower. This strong brand loyalty, based on physician's referrals, would typically enable firms to charge higher prices relative to costs than is the case in other markets in which consumers make purchasing decisions by comparing prices.

Second, the practice of marketing infant formula through the medical profession is costly and may make it difficult for new companies, particularly those that are not in the pharmaceutical industry, to enter the infant formula market. When new firms are unable to enter a market easily, existing firms are usually able to charge higher prices relative to the cost of producing a product.

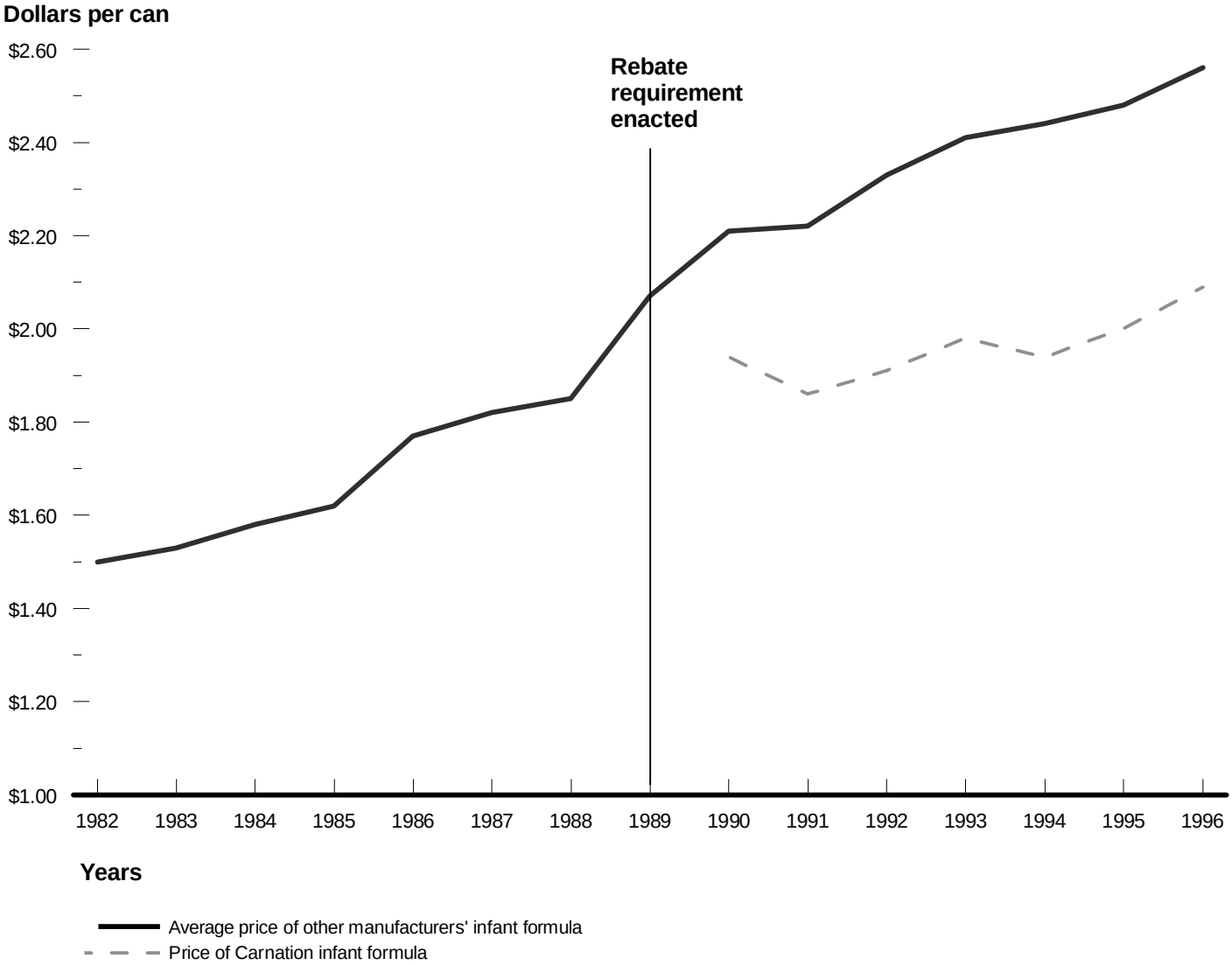
Finally, the U.S. infant formula market is made up of only three major firms—possibly because of the costs of entering the market. When only a few firms sell in a market, the market is considered "concentrated." Many studies have shown that more concentrated markets tend to be characterized by higher prices, relative to the cost of producing the product, than is the case in less concentrated markets.[12]

While the structure of the infant formula market may have resulted in prices that are high in relation to the cost of production, the structure may have changed in recent years with the entry of Carnation, a division of the Nestlé Corporation. Carnation effectively entered the infant formula

[12]While investigating the structure of the infant formula market, we did not investigate the competitiveness of the market under federal antitrust statutes.

market in 1990 and won its first WIC contract in 1992. Carnation changed the infant formula market by (1) marketing infant formula directly to consumers rather than by relying on the endorsements from the medical profession and (2) offering infant formula at wholesale prices that are significantly lower than the other manufacturers'. (See fig. 3.) Similarly, USDA officials told us that the sale of generic or store brands of infant formula is a growing trend in the industry, offering another lower-priced alternative to the major brands.

**Figure 3: Infant Formula Wholesale Prices for Carnation and Other Infant Formula Manufacturers, 1982-96**




Source: GAO's analysis of wholesale infant formula prices.

While experts on the infant formula market told us that Carnation has had difficulty increasing its market share because it does not market its

product through medical channels, the existence of a lower-priced competitor would generally tend to put competitive pressures on the industry.[13] In fact, price increases by other manufacturers were relatively low in the year that Carnation entered the U.S. market and have since risen more slowly then they did prior to 1989.

## Subsidy of WIC Infant Formula by Non-WIC Purchasers Is Unlikely

Although we did not have access to price and cost data that could help us determine definitively whether non-WIC consumers subsidized WIC through the prices they paid for infant formula, we relied on economic analysis and other available information to address the issue. Our analysis indicates that it is unlikely non-WIC purchasers subsidized WIC purchases of infant formula as a result of the rebate program. In economic terms, a subsidy of WIC by the non-WIC purchasers of infant formula would occur if a producer sold formula to the WIC market at less than the producer's cost of production and used the profits generated by the non-WIC purchasers paying a higher price to compensate for the loss.[14] Our economic analysis of the infant formula market, as well as other available evidence, suggests that while prices may have differed significantly between the WIC and non-WIC markets, it is unlikely that an economic subsidy of the WIC market by the non-WIC market occurred.

We conclude that an economic subsidy probably did not occur for several reasons. First, firms do not generally choose to sell a product at a loss, and if they find they cannot make a profit, they will leave the market.[15] For example, according to Wyeth-Ayerst officials, the company withdrew from both the WIC and non-WIC markets for infant formula in 1996 because of increasing costs in the overall infant formula market and the increasing size of the WIC market in which the firm found it could not meet its costs of production.

Second, firms that sell a product in two market segments will usually attempt to earn the highest profit possible in each segment and will not

[13]In addition, a Federal Trade Commission case and a number of court cases have considered the industry's pricing practices. These cases could also have put pressure on the industry to maintain lower prices.

[14]The cost of producing additional units of a good will typically include production or marketing costs but will not include any fixed or overhead costs. This is because "fixed" costs will not increase as more of a product is produced. Therefore, even if sales from a particular product line make no contribution to fixed costs, there may be no subsidy. For example, it is possible that only non-WIC sales contribute to fixed costs. As long as revenue from the WIC market covers all marginal costs of production, however, there is no economic subsidy between the two markets.

[15]This statement is based on the assumption, common to the field of economics, that a firm is primarily motivated to maximize profit.

sell in a segment in which it cannot make a profit. Given these general conditions, however, a firm may choose to sell its product at a loss in one market segment if by doing so it can increase demand and profits in the other segment enough to compensate for the loss.[16] In the case of infant formula, a firm would have to believe that by selling at a loss in the WIC market it could significantly increase sales in the non-WIC market—either through increased shelf space and/or physician recommendations—and profits from these additional sales would at least compensate for the loss in the WIC market. While such an effect could occur, it is unlikely that it would be sufficient to give manufacturers an incentive to sell to the WIC market—currently accounting for over 50 percent of all infant formula sales—at a loss.[17]

Third, while no data are available to us to estimate the actual cost of producing a can of infant formula, information presented in a 1992 court case suggests that infant formula manufacturers were not selling infant formula to WIC at a loss. In this case, an infant formula manufacturer's representative presented information on the costs of producing a can of infant formula in 1989 and 1990.[18] We compared these reported production costs to the WIC net price at the time and found that the WIC net price exceeded the cost of production by 2 to 13 cents per can, depending on the year.[19] While these estimates are dated and rebates have grown since 1990, possibly eroding the margin by which the WIC net price may exceed the cost of production, one infant formula manufacturer told us that the company does not and would not consider selling infant formula to WIC at a loss.

[16]For example, a retail store may choose to sell a product for less than its cost (as a loss leader) because it can increase profits by a greater amount through increased sales on an array of other products.

[17]Experts on the infant formula market told us that, in fact, these effects did not appear to be significant. For further discussion of a related issue—whether the possible spillover was sufficient to offset the decline in net prices from rebates in the WIC market—see app. I. That analysis shows that, in 1996, spillover effects would have had to result in a price of $3.82 per can of infant formula, instead of the actual price of $2.48 per can, to offset the lower net price in the WIC market and maintain manufacturers' revenue at the level it would have been in the absence of sole-source rebates.

[18]Testimony presented in infant formula antitrust litigation in the U.S. District Court for the Northern District of Florida, Tallahassee, June 2, 1992.

[19]Some corroborating evidence about the cost of producing infant formula appears in an unpublished USDA study conducted by the Research Triangle Institute in Apr. 1992 (Josephine Mauskopf and Nancy Dean, "WIC Program Rebates: An Economic Analysis," Final Report. Contract, # 53-3198-0-033, Task 6.1. Center for Economic Research) in which the cost of producing a can of infant formula was estimated on the basis of the ingredients that went into it. However, USDA officials expressed concerns about the validity of these cost estimates because of methodological limitations, including the unavailability of firsthand data on the procedure for manufacturing infant formula.

## Cost Savings From WIC Rebates for Other Products Will Not Reach the Magnitude of Those for Infant Formula

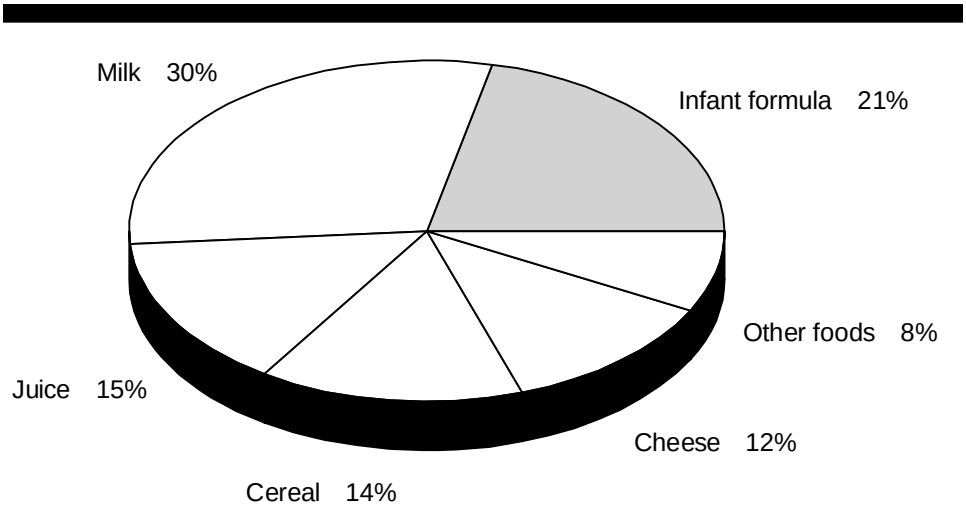
Rebates for other WIC food products could provide additional cost savings. However, such rebates will not generate the level of savings obtained through the rebates on infant formula, in part because these other food products do not account for as large a share of WIC food costs and in part because market characteristics for other products make it likely that manufacturers will offer smaller rebates for each item. Additionally, because there are multiple products within the juice or cereal food groups, the costs associated with administering rebates for these food products could be higher than those for infant formula. These higher administrative costs would partially offset the savings in food costs obtained from rebates. Finally, some other options to reduce costs may be more effective in generating savings for WIC than sole-source rebates for foods other than infant formula.

### Rebates for Other WIC Food Products Will Not Generate as High a Level of Savings in WIC Food Costs as Occurred With Infant Formula

Rebates for other food products will not generate the magnitude of savings that occurred with infant formula for two reasons. First, these other food products do not account for as large a proportion of WIC food costs as does infant formula. Before rebates were introduced, the cost of infant formula represented about 45 percent of WIC food costs. Because infant formula constituted such a large portion of total costs before rebates, the potential savings from rebates were sizable. Other products make up a much smaller share of total WIC food costs, as shown in figure 4, leaving less opportunity for rebates to reduce total WIC food costs. For example, adult cereals and juices, which have been identified as potential sources of cost savings from rebates, currently account for about 14 percent and 15 percent of WIC food costs, respectively, after adjusting for rebates on infant formula.[20]

[20]The potential for saving on milk and cheese is complicated by the USDA commodity support programs, which affect the prices for these products.

**Figure 4: Contribution to Fiscal Year 1996 WIC Food Costs After Rebates for Infant Formula**




Note: Other WIC foods include eggs, peanut butter, infant cereal, and beans.

Source: GAO's analysis of USDA's data.

The difference in the level of savings between infant formula and other WIC foods can be seen by California's experiment with rebates for adult juices. In March 1997, the California WIC agency implemented rebates for juices and expects to receive $12 million annually in juice rebates, or about 19 percent of its pre-rebate costs for juice. While these savings may well be worth pursuing, they do not come close to the $183 million in savings that California receives annually in infant formula rebates.

Similarly, as we reported in September 1997, nine states have introduced rebates for infant cereal, and three states have introduced them for infant juices.[21] However, these two products account for less than 1 percent each of total WIC food costs. In fiscal year 1996, rebates for infant cereal and infant juices provided $6.2 million in savings to the program and reduced food costs by about 0.6 percent in these states.

Second, rebates for other WIC foods will not result in the level of savings achieved for infant formula because the manufacturers of these other products are unlikely to offer such large rebates for each food item. In

[21]Food Assistance: A Variety of Practices May Lower the Costs of WIC (GAO/RCED-97-225, Sept. 17, 1997).

particular, characteristics of the infant formula market appear to have led to high prices relative to costs, indicating the likelihood of high profit margins and making high levels of rebates possible. In 1996, infant formula manufacturers returned 85 percent of the wholesale price of their product to WIC agencies in the form of rebates. The markets for other WIC food products, however, do not share certain characteristics of the infant formula market.

Specifically, while the infant formula market has only a few manufacturers, the markets for other WIC products, such as adult cereals and adult juices, generally have more firms as well as generic brands. In addition, while the purchasers of infant formula are likely to be very reluctant to change brands once one has been recommended by their physician, the purchasers of juice and cereals are not likely to be as reluctant to switch.[22]

Finally, manufacturers may have less incentive to offer substantial rebates for other WIC food products because they do not sell as much of their product to the WIC market. While WIC purchases of infant formula may account for more than half the infant formula market, WIC purchases of other food products account for a much smaller percentage of the markets for those products. For example, in 1996, supermarket sales of cold cereal totaled $7.5 billion, while WIC purchases of these cereals totaled $387 million, or 5 percent of the total. Therefore, a manufacturer of other WIC products would not win a significant share of the market by obtaining a sole-source WIC contract. The inability to gain a significant share would tend to reduce the firm's incentive to pursue the contract and hence reduce the size of rebates.

## Administrative Costs May Vary by Food Product and Reduce the Advantages of Rebates

Because infant formula products are nutritionally identical across brands, it is relatively easy to develop and administer rebate contracts. These contracts can be narrowly defined according to product type (e.g., milk-based or soy-based), and the state WIC agency's infant formula needs can generally be met by one contract. As a result, WIC agencies can use the redeemed vouchers to track the type and quantity of formula sold to WIC participants in order to determine the level of rebates they should receive from manufacturers.

[22]Firms producing other WIC foods, however, could benefit from brand loyalty for their product among WIC purchasers who, unlike consumers of infant formula, could continue to use the product for a number of years after they have left WIC.

In contrast, it will be more difficult to set up and administer rebate contracts for other WIC food products, such as adult cereal and juices.[23] Because there are multiple products in a juice or cereal food category and WIC participants may consume several types of each of these products, neither the design of the contracts nor the administration of the rebate program is as straightforward as is the case with infant formula. More specifically:

- Complexities in design of contracts. California's WIC agency developed five contracts for adult juices. California officials told us that, unlike infant formula which required only one contract, multiple contracts were necessary for adult juices because (1) there are many different types, (2) WIC officials wanted to provide participants with a choice of product, and (3) no single company was able to meet all WIC juice needs. Because the costs of designing and implementing multiple contracts were significant, a California WIC official said that state officials probably would not attempt to design rebate contracts for adult cereals.
- Complexities of monitoring sales and billing for rebates. With multiple products in a food category, tracking sales to ensure appropriate billing for rebates becomes more difficult. For example, a redeemed WIC food voucher will indicate that frozen juice was purchased but does not specify the type of juice among approved varieties, nor the quantity that was purchased. To overcome this problem in California, the state WIC agency contracted with a company to supply data on the quantities of each brand and type of juice sold in the entire California market. Then, assuming that the manufacturers' shares of the WIC juice market mirrored those shares in the entire juice market for the state, the WIC agency estimates the amount of sales for which companies should be billed. Although juice companies helped devise this billing method, one company has begun to question the amount of WIC sales for which it is being billed. Texas WIC officials also told us that the use of rebates in their state would not be feasible until it is possible to accurately track product sales. One possible solution to these problems would be the use of a method—currently under design in some states—whereby WIC agencies provide an electronically coded card to WIC participants to be used at grocery stores for the purchase of WIC-approved items. When the card is used, data are automatically collected about each purchase; therefore, the card would provide an efficient and accurate way to keep track of WIC sales for rebate billing.

[23]Infant cereal may be one of the other WIC products for which it is relatively easy to administer a rebate contract. Like infant formula, infant cereal is sold by only a few firms. In fact, Texas WIC agency officials told us that the ease of contract and rebate administration was one of the primary reasons rebates were established for infant cereal.

## Other Forms of Cost Savings May Be More Effective Than Rebates for Some Food Products

Other forms of cost savings, such as the use of the least costly brands, may be more effective than rebates for some food products. For example, the Texas WIC agency determined that the savings generated by specifying that WIC participants use the least costly product available would be greater than from using rebates. The least costly product could be, for example, a generic label or a national brand. The use of such products is possible for cereal and juice because, unlike infant formula, generic brands are available for these products. However, there is a drawback to requiring the purchase of the least costly brands, particularly if they are generic: If WIC participants do not like the product, they may find the WIC food basket less attractive and stop using it. For example, the Texas WIC agency stopped using generic peanut butter because WIC participants did not like the product and redeemed fewer WIC coupons for the product.

## Scope and Methodology

To develop the information on the issues discussed in this report, we spoke with, and obtained documents from, officials at FNS headquarters and the California and Texas WIC agencies. In addition, we spoke with an economist at USDA's Economic Research Service; industry representatives for infant formula and cereal and juice manufacturers, academic economists, and professors of business and marketing. We reviewed an economic study on WIC sole-source rebates produced by the Research Triangle Institute, as well as information presented in judicial proceedings concerning antitrust litigation on infant formula.

We analyzed the wholesale prices for infant formula from 1982 through 1996, as well as prices and price indexes for pharmaceutical, juice, and milk products, and general inflation in the economy from the DRI/McGraw-Hill economic database.[24] We also collected data on WIC rebates and WIC net prices for each of the infant formula manufacturers from officials at FNS headquarters. To adjust prices for inflation, we used the gross domestic product implicit price deflator, which is the generally accepted method for determining real prices. We used 1996 as the base year for this adjustment. In our analysis of infant formula prices, we used a 13-ounce can of infant formula concentrate as the basic unit of analysis because this is the predominant form in which infant formula is used in WIC.

We obtained information on the structure and characteristics of the infant formula, cereal, and juice markets from representatives of firms producing these products, as well as from economists specializing in the analysis of

[24]DRI/McGraw-Hill is a company that focuses on economic analyses and data collection.

the infant formula and cereal markets. In addition, we contacted the three current major manufacturers of infant formula as well as the manufacturer that left the market as a brand producer in 1996. Three of the firms responded to our requests but would not discuss prices or price changes for their products and did not provide us with data. Since much of the information on manufacturers' cost of production and pricing policies is proprietary to the firms, no empirical evidence was available to enable us to definitively answer the question of the economic subsidy of the WIC market.

We conducted our work from July 1997 through April 1998 in accordance with generally accepted government auditing standards. While we did not independently verify the data used in this report, the data are commonly used by economists and other analysts studying WIC and the infant formula market.

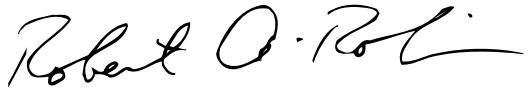
## Agency Comments

We provided copies of a draft of this report to the U.S. Department of Agriculture's Food and Nutrition Service for its review and comment. We met with agency officials, including the Chief of the Program Analysis and Monitoring Branch, Special Supplemental Food Division; the Chief of the Special Nutrition Analysis Branch, Office of Analysis and Evaluation; and the Chief of the Audits and Management Control Branch, Grants Management Division. The Food and Nutrition Service generally agreed with the report's findings and provided us with a number of technical comments that we incorporated into the report as appropriate.

We are sending copies of this report to the appropriate congressional committees, interested Members of Congress, the Secretary of Agriculture, and other interested parties. We will also make copies available upon request.

If you have any questions, please call me at (202) 512-5138. Major contributors to this report are listed in appendix II.

Sincerely yours,



Robert A. Robinson
Director, Food and
Agriculture Issues

# What the Calculation of Wholesale Price in Non-WIC Market Would Have to Be to Offset the Lower WIC Price

This appendix discusses the analysis we used to estimate the wholesale price for infant formula in the non-WIC market that would have kept manufacturers' revenue—with rebates in effect—the same as it would have been in the absence of rebates.[25] Our analysis indicates that in 1996, for example, when the WIC net price was $0.38 per can of infant formula, the non-WIC price would have had to be $3.82 per can to keep manufacturers' revenue the same as it would have been in the absence of sole-source rebates. This $3.82 price is significantly higher than the actual wholesale price of $2.48 per can for that year. Therefore, although spillover effects may have resulted in increased demand and prices in the non-WIC market, these effects did not generate price increases large enough to offset the decline in net prices in the WIC market segment resulting from rebates.

In order to conduct this analysis, we first had to calculate what the wholesale price would have been in the absence of rebates. We did this by assuming that after the introduction of sole-source rebates, wholesale prices increased at the same rate as prices in the pharmaceutical industry. We chose the pharmaceutical industry because infant formula is produced by pharmaceutical companies and because infant formula tracked increases in pharmaceutical prices through the mid-1980s.

Next, we calculated the price in the non-WIC market that would have kept manufacturers' revenue, with rebates in effect, equal to what it would have been in the absence of rebates. We refer to this price as $P_{C,}$ or the WIC compensating price. We used the following equations to calculate the WIC compensating price:

(1) Total sales revenue without rebates = $(P_{NR} * Q)$

(2) Total sales revenue with rebates = $(P_W * WMS * Q) + (P_C * NWMS * Q)$

$P_{NR}$ = Wholesale price in the absence of rebates

$P_C$ = Price in non-WIC market that would have compensated for low price in WIC market

Q = Quantity of infant formula sold, with and without rebates

$P_W$ = WIC price, with rebates

[25]This analysis is based on the methodology presented in Josephine Mauskopf and Nancy Dean, "WIC Program Rebates: An Economic Analysis, Final Report," Contract # 53-3198-0-033, Task 6.1 (Research Triangle: Center for Economic Research, Apr. 1992), pp. 3-10.

WMS = WIC market share, with rebates

NWMS = Non-WIC market share, with rebates

Total sales revenue without rebates—equation 1—is set equal to total sales revenue with rebates—equation 2— and the equation is solved for $P_C$:

(3)

$$P_{NR}*Q=(P_W*WMS*Q)+(P_C*NWMS*Q)$$

(3a)

$$P_{NR}=(P_W*WMS*Q/Q)+(P_C*NWMS*Q/Q)$$

(3b)

$$(P_{NR}-(P_W*WMS))=P_C*NWMS$$

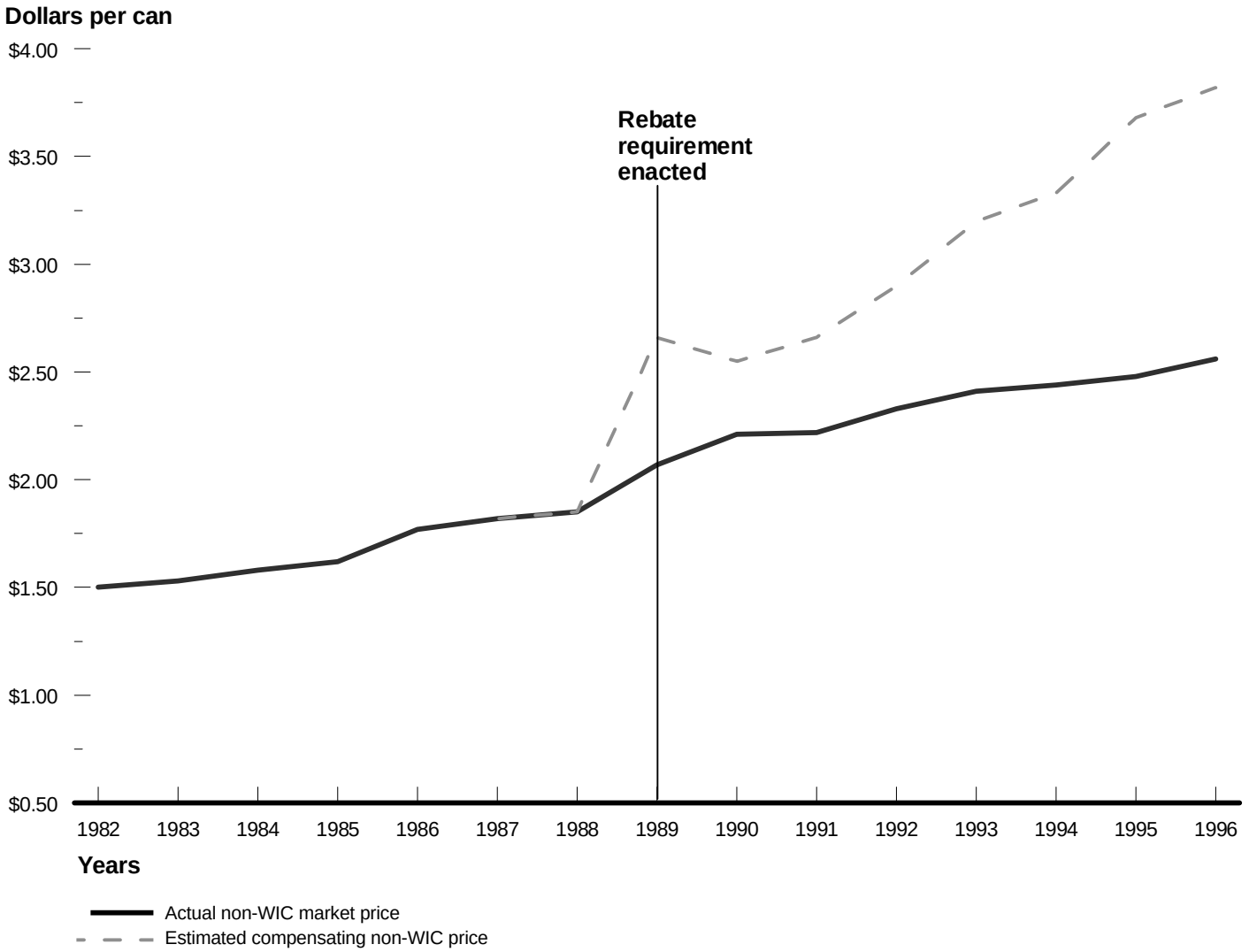
(3c)

$$(P_{NR}-(P_W*WMS))/NWMS=P_C$$

We conducted a number of interim calculations to provide data that enabled us to calculate the WIC compensating price. For example, we calculated the WIC and non-WIC market share for any given year by linear interpolation. We did this because, according to industry sources, the WIC proportion of the infant formula market increased from about one third in 1989 to over one half by 1996, but we did not know the actual rate of increase. Linear interpolation allowed us to distribute the 6-year increase equally among the intervening years. Because the infant formula market is divided between the WIC and non-WIC segments, the analysis specifies that the WIC and non-WIC portion of the market equal 1. In addition, the analysis assumes that WIC and non-WIC purchasers of infant formula are not sensitive to price changes and that the total quantity sold is the same both with and without rebates.

The results of our analysis are shown in figure I.1. They indicate that although spillover effects may have resulted in higher demand and therefore higher prices in the non-WIC market, the increased prices were not large enough to fully offset the declines in net prices in the WIC market resulting from rebates.

**Figure I.1: Estimated Compensating Non-WIC Price Compared With Actual Non-WIC Wholesale Market Price**




Note: The actual non-WIC market price is the average year-end wholesale price of Mead Johnson, Ross, and Wyeth-Ayerst. The estimated compensating non-WIC price is a calculated, rather than a market, price.

Source: GAO's analysis of infant formula prices.

# Major Contributors to This Report

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