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Infant Formula Prices and Availability

An Interim Report to Congress

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Abstract

Over half of all infant formula consumed in the United States is purchased through USDA's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Consequently, there is continuing interest by USDA and Congress in the price of infant formula, competition in infant formula pricing, and the effects of the WIC program on retail prices for the general public. This interim report responds to Congress's request for a study on the number of suppliers of infant formula in each State or major marketing area and a comparison of the costs of formula that is included in the WIC program versus that of other formula. Infant formula from the three major manufacturers, which accounts for 99 percent of all sales, was available in supermarkets in each of 64 market areas examined. Additionally, products in powder form from a fourth manufacturer were available in supermarkets in 83 percent of the market areas. Preliminary results indicate that within the market areas, there is not a clear relationship between a formula's being the WIC contract brand and its having the highest average retail price.

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Contents

Executive Summaryiii
Definitionsv
Introduction1
Overview of the WIC Program3
Participant Eligibility .....	.3
Participant Benefits .....	.3
Food Delivery Systems .....	.4
WIC Infant Formula Rebate Program .....	.5
Domestic Infant Formula Market .....	.8
Source of Data .....	.12
Limitations of the Data .....	.14
Availability of Infant Formula .....	.15
Retail Price of Infant Formula .....	.18
Milk-Based Liquid Concentrate .....	.19
Milk-Based Powder Formula .....	.19
Conclusions .....	.24
References .....	.25
Appendix A— History of the WIC Infant Formula Rebate Program .....	.27

Executive Summary

USDA's Supplemental Nutrition Program for Women, Infants, and Children (WIC) infant formula rebate program began in the late 1980s when rising infant formula costs led several States to negotiate contracts with the manufacturers. Under the guidance of USDA regulations, WIC State agencies obtain significant discounts in the form of rebates from infant formula manufacturers. In exchange for the rebates, the manufacturers are given exclusive rights to provide infant formula to WIC participants, who now account for over half of all infant formula sold in the United States. While net prices to WIC have declined, the retail price of infant formula has continued to increase. Recently, Congress expressed concern about the rise in the cost of infant formula since the WIC rebate program began and in the decline in the number of infant formula suppliers (H.R. 106-157). In October 2000, Congress directed USDA's Economic Research Service (ERS) to report on the "number of suppliers of infant formula in each state or major marketing area, and to compare the cost of formula that is included in the WIC rebate program versus the cost of formula that is not in the WIC rebate program" (H.R. 106-948). This report presents preliminary findings from that ongoing study.

The infant formula manufacturing industry is highly concentrated. In both 1987—when the rebate system began—and 2000, three manufacturers accounted for 99 percent of the market, with Ross and Mead Johnson accounting for 87-90 percent of the market in both years. While the concentration of producers has remained high, there have been significant changes among the firms. First, the market shares of the two largest firms have changed markedly over the last decade. This appears to be closely related to changes in the firms' shares of the WIC infant formula market. Mead Johnson's share of the overall infant formula market increased from 27 percent in 1994 to 52 percent in 2000 as its share of the WIC infant formula market almost tripled from 23 to 68 percent over the same period. Second, the third largest producer in 2000—Carnation—entered the U.S. market after the rebate program began and currently has contracts to provide formula to the WIC program in two States, Florida and New Jersey, and has recently been awarded a contract in Virginia that begins in July 2000. Third, Wyeth, which withdrew from the domestic infant formula market in 1996, reentered the market in 1997 as a manufacturer for PBM, a new firm that markets formula directly to consumers but does not itself produce infant formula. PBM infant formula products are aggressively priced and tend to average almost 40 percent less at retail than Ross and Mead Johnson products.

This is the first national study to analyze infant formula prices at the retail level; most previous studies examined wholesale prices. The use of retail prices has enabled the study to examine directly the prices faced by non-WIC consumers. The primary source of data for the study is Information Resources Incorporated (IRI) InfoScan, a scanner-based retail sales data product. Aggregate supermarket sales data were obtained for 64 individual local market areas and aggregate national sales data were obtained for supermarkets, drugstores and mass merchandisers.

According to the supermarket data, Mead Johnson, Ross, and Carnation infant formula products were available in each of the 64 market areas in 2000. Wyeth products, distributed by PBM, were found in supermarkets in 53 of the 64 market areas (83 percent). Due to the unavailability of market area data for drugstores and mass merchandisers, we were unable to determine if Wyeth products were completely absent in the other 11 markets. At the national level, over 40 percent of Wyeth sales by volume are made through drugstores and mass merchandisers.

The study also examines average retail prices in supermarkets in the individual market areas. Supermarkets account for over two-thirds of retail sales of infant formula and the majority of WIC formula sales. Because prices vary widely by product form, product base, package size, and other attributes, the price analysis is confined to the two most commonly available products: standard milk-based formula in 13-ounce cans of liquid concentrate and 12- to 32-ounce cans of standard milk-based powder formula. The study was able to assign a single WIC contract brand in 55 of the 64 market areas. For the remaining nine market areas, which spanned State lines and had different WIC formula contract manufacturers, it was not possible to assign a single WIC contract brand in those markets.

In the 55 market areas with a single WIC-contract brand, Mead Johnson had 34, Ross had 17, and Carnation had 4 areas. The average retail price of formula varied widely by manufacturer and among the market areas. For example, the price of 26 ounces of reconstituted standard milk-based powdered infant formula ranged from \$1.43 to \$2.96. Preliminary results indicate that within market areas, average retail prices of WIC contract brand formula were not systematically higher than non-WIC formula. For 13-ounce cans of liquid concentrate, the WIC contract brand had the highest average retail price in only 28 of the 55 market areas and tied for highest average price in 5 additional markets. In 22 markets, the WIC contract brand did not have the highest average price. For milk-based powder, the WIC contract brand's average price was highest in only 22 markets, fewer than were found for the liquid concentrate.

ERS continues to examine the factors influencing retail prices and the relationship between the retail price of the WIC contract brand of infant formula and the retail prices of other brands of infant formula. The results of this ongoing analysis will be presented in the final report due to Congress August 31, 2001.

Definitions

Infant formula: as defined in the Federal Food, Drug, and Cosmetic Act, infant formula means a food that purports to be or is represented for special dietary use solely as a food for infants by reason of its simulation of human milk or its suitability as a complete or partial substitute for human milk (FDC Act 21 U.S.C. 321 (z)).

Exempt infant formula: as defined in the Federal Food, Drug, and Cosmetic Act, exempt infant formula is any infant formula that is represented and labeled for use by an infant who has an inborn error of metabolism or a low birth weight or who otherwise has an unusual medical or dietary problem (FDC Act 21 U.S.C. 350a).

Standard infant formula: as defined in this report, standard infant formula includes milk-based and soy-based infant formulas, excluding specialized infant formula, that meet the nutritional needs of most full-term, healthy infants less than 1 year old.

Specialized infant formula: as defined in this report, specialized formula includes formula for children with special nutritional requirements, such as hypoallergenic formula, thickened formula, formula to treat diarrhea, formula for premature babies, formula for infants with other diseases or disorders such as PKU, as well as lactose-free (nonsoy) formula, and formula marketed to children 1 year of age or older. (Special-

ized infant formula may include some nonexempt infant formula.)

Contract brand: all the infant formula, excluding exempt infant formulas, produced by the manufacturer awarded the WIC contract.

Primary contract brand: the standard infant formula on which bids are solicited.

Manufacturer's wholesale price: the manufacturer's lowest national wholesale price per unit for a full truckload of infant formula.

Medical detailing: the manufacturer's practice of contacting hospitals and medical practitioners directly, providing them with free or discounted infant formula, and encouraging physicians to recommend one particular brand of formula (GAO, 1990). Medical detailing also includes providing hospitals with "discharge packs" containing formula samples, cents-off coupons, and company advertising aimed at mothers when they leave the hospital with their babies; such activities may serve as an implicit endorsement of a particular brand of infant formula by the hospital. Medical detailing also includes other types of support, such as donating equipment and services to hospitals (e.g., incubators, nursers, calendars, pens, etc.) and providing funding for research on infant nutrition to hospitals and physicians.

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Introduction

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) helps safeguard the health of low-income pregnant, breastfeeding, and postpartum women, infants, and children up to age 5 who are at nutritional risk by providing a package of supplemental foods, nutritional education, and health care referrals.

Although WIC encourages mothers to breastfeed, a majority of participating infants receives infant formula through WIC. In the mid-1980s, infant formula accounted for nearly 40 percent of total WIC food costs and infant formula retail prices were rising more quickly than prices for other foods. These factors led Tennessee and other States to look into cost containment practices to reduce infant formula costs. Tennessee initiated a rebate contract system in 1987. In 1989, P.L. 101-147 required States to use competitive bidding—or an alternate method that would yield savings equal to or greater than those produced by competitive bidding—to procure infant formula. Indian State agencies with 1,000 or fewer WIC participants are exempt from this requirement.

WIC State agencies typically use competitive bidding to award a contract to a single manufacturer of infant formula for the exclusive right to provide its product to WIC participants in the State. The contract-winning manufacturer is then billed for the amount of the rebates on the formula issued to WIC participants. In fiscal year 2001, WIC is projected to receive almost \$1.55 billion from infant formula rebates, an amount that supports 28 percent of WIC participants (USDA, 2000c).

WIC is an influential agent in the infant formula market. Infants participating in the WIC program consume

over half of all infant formula sold in the United States. Some observers have hypothesized that WIC's infant formula rebate program may significantly affect the infant formula market and the prices faced by non-WIC consumers. For example, by channeling large volumes of guaranteed purchases to contract-winning manufacturers, the WIC rebate program may have the effect of reducing the number of infant formula manufacturers. If so, reduced competition could lead to higher retail prices. In addition, prices could rise as a result of the WIC rebate program if the demand for a particular infant formula increased in the non-WIC market due to the manufacturer of that formula having won the WIC contract (GAO, 1998). This could happen if, as a result of winning a WIC contract, a manufacturer was able to obtain increased shelf space in retail stores or if physicians or hospitals were more likely to recommend the contract-winning formula to their non-WIC patients.

In 1999, Congress expressed concern about the rise in the cost of infant formula since the WIC rebate program began and the decline in the number of infant formula suppliers (H.R. 106-157). In October 2000, Congress directed USDA's Economic Research Service (ERS) to report on the "number of suppliers of infant formula in each state or major marketing area, and to compare the cost of formula that is included in the WIC rebate program versus the cost of formula that is not in the WIC rebate program" (H.R. 106-948). This interim report, a result of that mandate, uses scanner-based retail sales data to examine these issues. This is the first comprehensive national study to analyze prices of infant formula at the retail level; most of the previous work examined wholesale infant formula prices (for example, see GAO, 1998). The use of retail prices enables this study to examine directly the infant formula prices faced by non-WIC consumers.

The next few sections describe the WIC program, the infant formula rebate system, the major features of the domestic infant formula market, and the data set used in the analysis. The sections “Availability of Infant Formula” and “Retail Price of Infant Formula” specifi-

cally respond to the directives made by Congress. The concluding section summarizes the study’s major findings to date and outlines topics that continuing research will address. The appendix presents a history of WIC’s infant formula rebate system.

Overview of the WIC Program

WIC was created as a 2-year pilot program in 1972 by an amendment to the Child Nutrition Act of 1966 (P.L. 92-433). The program was made permanent in 1975 by P.L. 94-105, which stated that “Congress finds that substantial numbers of pregnant women, infants, and young children are at special risk in respect to their physical and mental health by reason of poor or inadequate nutrition or health care, or both.” WIC is based on the premise that early intervention programs during critical times of growth and development can help prevent future medical and developmental problems. Administered by USDA’s Food and Nutrition Service (FNS), the program currently provides grants for supplemental foods, nutrition services, and administration to 88 WIC State agencies, including the 50 States, the District of Columbia, Guam, the U.S. Virgin Islands, American Samoa, the Commonwealth of Puerto Rico, and 33 Indian Tribal Organizations.

WIC has grown dramatically since its beginning and is now one of the central components of the Nation’s food assistance system. In fiscal year 2000, WIC served an average of 7.2 million participants per month, of whom roughly a quarter were infants, a quarter were women, and half were children (USDA, 2000a). Almost half of all infants in the United States now participate in the program.¹ Federal program costs totaled almost \$4 billion in fiscal year 2000, making WIC the country’s third largest food assistance program in terms of total expenditures, exceeded only by the Food Stamp Program (\$17.0 billion) and the National School Lunch Program (\$6.1 billion) (USDA, 2000a). WIC accounts for about 12 percent of the total Federal Government expenditures for food and nutrition assistance.

Participant Eligibility

To qualify for WIC, applicants must meet categorical, income, and nutritional risk eligibility requirements.

Categorical Eligibility. To participate in the WIC program, a person must be:

- A pregnant woman (includes women up to 6 weeks postpartum),

¹The percentage of infants who participate in WIC ranges from 30 to over 70 percent across States.

- A nonbreastfeeding woman up to 6 months postpartum,
- A breastfeeding woman up to 1 year postpartum,
- An infant under 1 year of age, or
- A child up to his/her fifth birthday.

Income Eligibility. The family income of WIC applicants must meet specified guidelines.² All States currently set the income cutoff at the maximum 185 percent of the Federal poverty line (\$31,543 for a family of four in July 2000). Applicants who participate in or who have certain family members who participate in the Food Stamp, Medicaid, or Temporary Assistance for Needy Families (TANF) programs, are adjunctively income eligible; that is, they are deemed to meet the income eligibility criteria automatically.³ Some of these programs, particularly Medicaid, have higher income thresholds for certain WIC categories, usually pregnant women and infants.

Nutritional Risk. Applicants must be at nutritional risk, as determined by a health professional such as a physician, nutritionist, or nurse. Federal regulations recognize five major types of nutritional risk for WIC eligibility: (1) detrimental or abnormal nutritional conditions detectable by biochemical or anthropometric measurements; (2) other documented nutritionally related medical conditions; (3) dietary deficiencies that impair or endanger health; (4) conditions that directly affect the nutritional health of a person, including alcoholism or drug abuse; and (5) conditions that predispose persons to inadequate nutritional patterns or nutritionally related medical conditions, including, but not limited to, homelessness and migrancy (7 CFR 246.2).

Participant Benefits

The WIC program offers three types of benefits to participants, free of charge: a supplemental food package, nutrition education, and referrals to health and other services.

²WIC regulations state that the maximum allowable family gross income (i.e., before taxes are withheld) must not exceed the guidelines for reduced-price school meals, which are 185 percent of the U.S. Poverty Income Guidelines (7 CFR 246.7). State agencies may set the income guidelines equal to State or local guidelines for free or reduced-price health care, as long as they are equal to or less than 185 percent of the poverty guidelines and greater than 100 percent of the poverty guidelines.

³In April 1998, about half of all WIC participants also participated in at least one of these three programs (Bartlett et al., 2000).

Supplemental Food Package. WIC provides participants with supplemental foods that are high in nutrients lacking in their diets. Nutritional weaknesses may result in adverse health consequences. There are seven different food packages, based on the category of the participant, as follows: (1) infants through 3 months, (2) infants 4-12 months, (3) children 1-4 years old, (4) pregnant and breastfeeding women (basic), (5) non-breastfeeding postpartum women, (6) breastfeeding women (enhanced), and (7) children or women with special dietary needs. WIC supplemental foods include iron-fortified infant formula, iron-fortified infant and adult cereal, vitamin C-rich fruit and/or vegetable juice, eggs, milk, cheese, peanut butter, tuna fish, carrots, and dried beans or peas.⁴ Breastfeeding women whose infants do not receive formula from WIC can receive an enhanced food package that includes tuna and carrots in addition to other WIC foods.

Nutrition Education. WIC makes nutrition education, including breastfeeding promotion and support, available to all participants (or to the parents or caretakers of infant or child participants). The nutrition education is designed to achieve two broad goals: (1) to stress the relationship between proper nutrition and good health and raise awareness about the dangers of using drugs and other harmful substances, and (2) assist the individual in achieving a positive change in food habits, resulting in improved nutritional status and in the prevention of nutrition-related problems through the use of the supplemental foods and other nutritious foods (7 CFR 246.11). Local WIC agencies are required to offer participants at least two nutrition education sessions during each 6-month period, in either

⁴The maximum monthly allowance for food package I—infants 0-3 months—is 403 fluid ounces of concentrated liquid infant formula (powdered or ready-to-feed formula may be substituted at specified rates). The maximum monthly allowance for food package II—infants 4-12 months—is the same as that for package I with the addition of 96 fluid ounces of reconstituted fruit juice and 24 ounces of infant cereal.

an individual or group setting. However, individuals who do not attend the nutrition education activities are not denied the WIC food package.

Referrals to Health Care and Social Services. WIC was designed to operate as an adjunct to health care. Local WIC agencies assist WIC participants in obtaining health care and social services (such as food stamps, Medicaid, immunizations, etc.), either through onsite health services or referrals to other agencies.

Food Delivery Systems

To provide program participants with supplemental food packages, the States may use three types of food delivery systems (or any combination of the three):

- Retail food delivery systems—participants obtain supplemental food by transacting a food instrument (e.g., check or voucher) at authorized retail vendors (e.g., grocery stores).
- Home food delivery systems—supplemental foods are delivered to the participant's home.
- Direct distribution food delivery systems—participants pick up supplemental foods from storage facilities operated by the State or local agency.

The vast majority of WIC participants receive their supplemental foods benefits via retail food delivery systems. WIC State agencies issue food instruments to participants, who then transact the food instruments for specific supplemental foods at authorized retail vendors. The food instrument specifies the type and amount of supplemental foods that can be obtained. Only those vendors who are authorized by the WIC State agency may transact and redeem food instruments. Approximately 48,000 vendors were authorized by WIC State agencies nationwide as of fiscal year 1999. Vendors must provide the supplemental foods at the current price or at less than the current price charged to other consumers.

WIC Infant Formula Rebate Program

WIC's infant formula rebate program began in 1987 when rising infant formula costs led Tennessee to negotiate a contract with the manufacturers.⁵ Following Tennessee's lead, Federal regulations were introduced that govern the operation of the rebate program. Current Federal regulations specify that all WIC State agencies must, by statute, operate a cost containment system for the procurement of infant formula except those States with home delivery or direct distribution food delivery systems or Indian State agencies with 1,000 or fewer participants (7 CFR Part 246). Those State agencies required to operate a cost containment procedure system for infant formula must use a sole-source (i.e., single-supplier) competitive system unless an alternative system provides savings equal to or greater than a sole-source competitive system.⁶ Under the sole-source competitive system, a WIC State agency uses competitive bidding to award a contract to a manufacturer of infant formula in exchange for a rebate for each can of infant formula that is issued to participants. The State agency issues only the contract brand of infant formula except when medical documentation supports the use of another infant formula product. As a result, the brand of infant formula provided by WIC will vary by State according to which company has the contract. Generally, infant formula rebate contracts are for 3 years.

At the WIC State agency's option, solicitation for bids can take one of two forms: single solicitation or separate solicitations. Under single solicitation, the request for bids is for a single iron-fortified milk-based infant formula that is suitable for routine issuance to the majority of generally healthy, full-term infants. This is referred to as the primary contract brand infant formula. The primary contract brand infant formula must be offered in all physical forms (i.e., concentrated liquid, powdered, and ready-to-feed); and it cannot be an exempt infant formula, which is defined as any formula that is represented and labeled for use by an infant who has an inborn error of metabolism or a low birth weight or who otherwise has an unusual medical

or dietary problem (exempt infant formula is not required to have a rebate). Bidders are required to specify a rebate amount for the primary contract brand infant formula for each of the three physical forms of infant formula.

The sole-source contract is awarded to the bidder offering the lowest total monthly net price, as determined by the submission of sealed bids, for a standardized amount of the primary contract brand infant formula by physical form.⁷ WIC regulations define net price as the difference between an infant formula manufacturer's lowest national wholesale price per unit for a full truckload of infant formula and the rebate level offered by the manufacturer.

All the different types of infant formula produced by the manufacturer awarded the infant formula contract (except exempt infant formula) are referred to as contract brand infant formula. The winning bidder is required to supply and provide rebates for all the contract brand infant formula the WIC State agency chooses to issue. Bidders that do not produce soy-based infant formulas must subcontract with another manufacturer to supply a soy-based infant formula under the contract. The amount of the rebate on the contract brand infant formula is based on the same percentage discount for the particular physical form of the primary contract brand infant formula. For example, if the rebate offered for the primary contract brand of powdered infant formula was 85 percent of the manufacturer's wholesale price, then the rebate for all other powdered forms of the contract brand infant formula would also be 85 percent of their wholesale price.

Under the process for separate solicitations, solicitations are issued for milk-based and soy-based infant formulas separately. This can increase competition for WIC contracts by allowing new or smaller infant formula manufacturers with a limited product line to bid on contracts (65 FR 51213-51229, August 23, 2000). Although two manufacturers have been awarded an individual State's contract in the past, currently in each State, only one manufacturer holds the WIC contract.

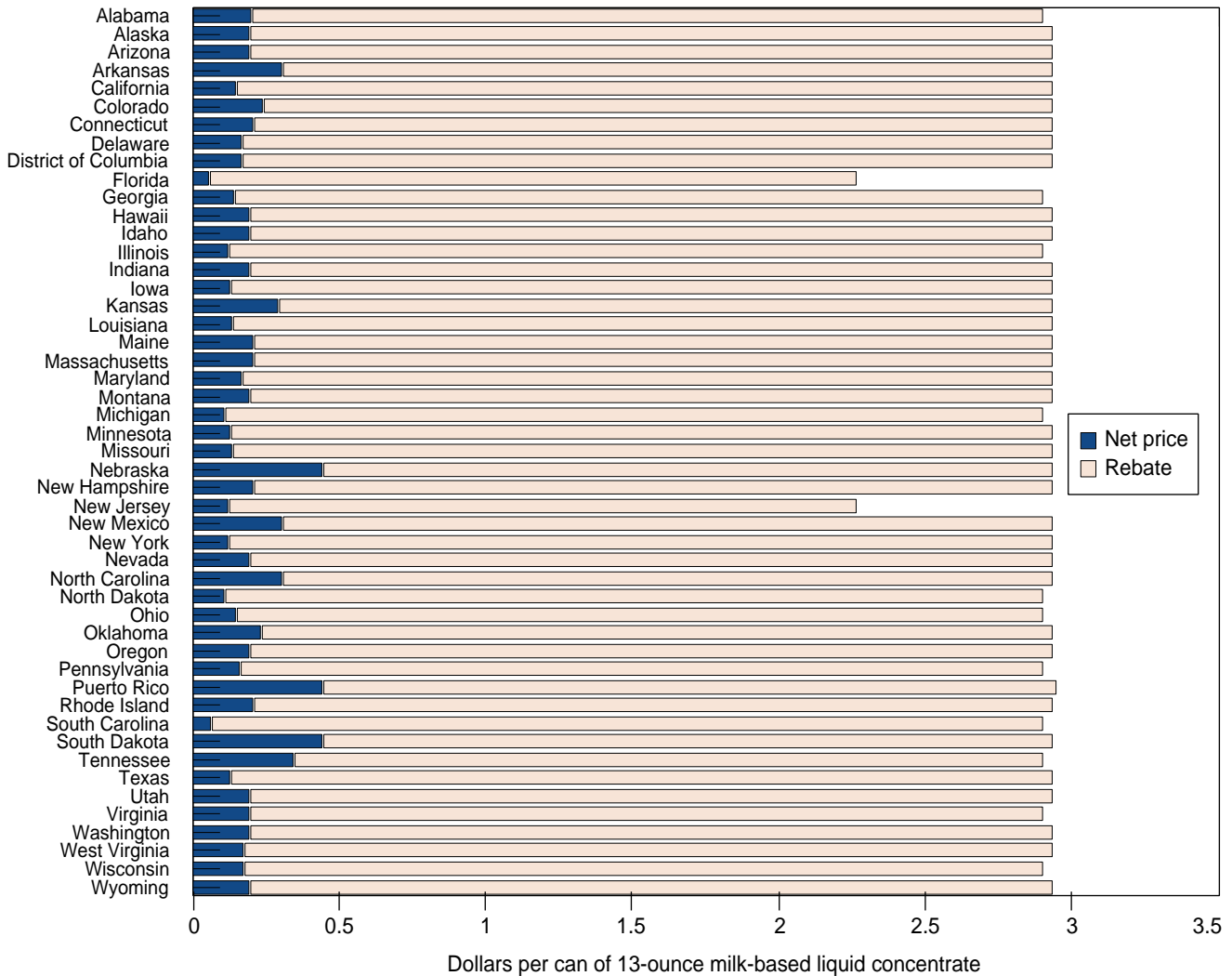
⁵See Appendix A for a more detailed discussion of the history of the infant formula rebate program.

⁶An interim rule, effective October 2000, strengthened and simplified the requirements for operating a sole-source infant formula rebate system (65 FR 51213-51229, August 23, 2000).

⁷WIC State agencies can elect to award the WIC contract to the bidder offering the highest monthly rebate if the weighted average retail prices for different brands of infant formula in the State vary by 5 percent or less.

Figure 1

Wholesale price, WIC rebate, and net price of milk-based infant formula by State, September 2000¹



¹Net price plus rebate equals the wholesale price.

Notes: Mississippi operates a direct distribution system, Vermont operates a home delivery system, and Kentucky uses a composite price for milk and soy-based infant formula.

Source: USDA's Food and Nutrition Service, 2000d.

The WIC State agency may choose to issue all or some of the different types of contract brand infant formula. Any noncontract brand infant formula (including exempt infant formulas and formulas not manufactured by the WIC contract manufacturer) may be issued only with medical documentation that an infant has a condition that dictates the formula's use.⁸ The documentation must be provided by a licensed health care professional authorized to write medical prescriptions under State law.

⁸The only exception to this rule is that local WIC agencies may issue noncontract brand infant formula without medical documentation in order to accommodate religious eating patterns (65 FR 51213-51229, August 23, 2000).

Infant formula issued to WIC participants is usually in concentrated liquid or powdered forms. However, formula may be issued in ready-to-feed form in special situations, such as when the participant's household does not have an adequate and safe water supply or refrigeration, or if the person caring for the participant may have difficulty in correctly diluting concentrated liquid or powdered forms of infant formula.

As noted, most WIC participants receive food instruments, such as vouchers, that they transact for the contract brand of infant formula at authorized retailers. The WIC State agency then reimburses the vendor for the full retail price of the infant formula. WIC State agencies are required to consider the prices a vendor

applicant charges for supplemental foods, and WIC vendors are not allowed to mark up the price of the contract brand of infant formula more than other brands. The WIC State agency or the WIC State agency's financial institution bills the contract-winning manufacturer for the rebate agreed to in the contract. As a result, the actual cost of infant formula to the WIC program equals the retail cost minus the amount of the manufacturer's rebate.⁹

In fiscal year 2000, 67 of the 88 WIC State agencies operated a competitive sole-source rebate system in conjunction with a retail food delivery system.¹⁰ There are 7 multistate systems in place, involving 40 WIC State agencies. Under these systems, WIC State agencies join together in a single rebate agreement to obtain infant formula. In this way, WIC State agencies with small- to medium-size populations can pool their buying power to leverage higher rebate levels (Liu, 1991).

⁹The net price, as defined in a WIC infant formula rebate contract, is wholesale price minus the rebate. Because the retail price is wholesale price plus the retail markup, the cost of infant formula to the WIC program—retail price minus the rebate—differs from the net price received by the manufacturer by the amount of the retail markup.

¹⁰Vermont (home delivery system) and Mississippi (direct distribution system) did not use retail grocery stores to distribute WIC foods. In addition, 19 Indian Tribal State Agencies with participation of less than 1,000 either did not operate a cost containment system for infant formula or else used a cost containment procedure other than a competitive sole-source rebate system.

As of September 2000, only three manufacturers—Mead Johnson, Ross, and Carnation—held WIC infant formula rebate contracts. The wholesale prices for a 13-ounce can of milk-based liquid concentrate infant formula with iron varied by company—for Carnation \$2.27, Ross \$2.91, and Mead Johnson \$2.94 (fig. 1).¹¹ Because the wholesale price reflects the manufacturer's lowest *national* wholesale price, the wholesale price for an individual manufacturer does not vary by State (territories and Indian Tribal Organizations are excluded from this discussion). On the other hand, the amount of the rebate, determined by the submission of sealed bids, varied by State, ranging from \$2.14 in New Jersey to \$2.866 in New York. Rebates as a percentage of the WIC contract winning manufacturer's wholesale price ranged from about 85 percent in Nebraska and South Dakota to almost 98 percent in South Carolina. In other words, the infant formula purchased through the WIC program cost South Carolina about 2 percent of its wholesale cost plus the amount of the retail markup. Net price, defined in a WIC infant formula contract as the wholesale price minus the rebate, also varied greatly by State, ranging from 6.5 cents in Florida to 44.7 cents in Nebraska and South Dakota.

¹¹In September 2000, Carnation held WIC infant formula rebate contracts in Florida and New Jersey. Carnation has recently been awarded a third contract in Virginia that begins in July 2001.

Domestic Infant Formula Market

Infant formula was introduced in the United States in the early 1900s primarily to feed infants whose mothers had died during childbirth. The large-scale manufacture of infant formula did not appear until after World War II. Although breastfeeding is widely acknowledged as the best method of feeding most infants, many women do not breastfeed their infants (see box on breastfeeding rates in the 1990s).¹² In 1979, Congress recognized the critical importance of the availability of infant formula that is safe and nutritious. In order to improve protection of infants consuming commercial infant formula, Congress passed the Infant Formula Act of 1980, which provided the legislative basis for greater regulatory control over the production of infant formula.¹³ Provisions of the Act (along with 1986 amendments) established minimum (and in some cases maximum) nutrient levels for infant formula, thereby ensuring that it had adequate known nutrients and, in certain respects, standardizing its nutritional content. The Act also provided the legislative basis for quality control procedures for producing infant formula and gave the Food and Drug Administration (FDA) the authority to enforce standards for infant formula marketed in the United States.

A wide variety of infant formulas are available. Conventional milk-based infant formula (containing lactose and cow's milk proteins) is the most widely used.¹⁴ Soy-based formulas are available as one alternative for infants who do not tolerate cow's milk-based formula well. According to FNS, "the best impartial medical evidence strongly demonstrates that milk-based, lactose-containing and soy-based, lactose-free

¹²The American Academy of Pediatrics (AAP) recognizes breastfeeding as the ideal method of feeding infants and achieving optimal infant and child health, growth, and development (American Academy of Pediatrics, 1997). AAP recommends exclusive breastfeeding for approximately the first 6 months after birth and the gradual introduction of iron-enriched foods in the second half of the infant's first year to complement the breastmilk diet. Breastfeeding is recommended for at least 12 months and thereafter for as long as mutually desired.

¹³Congress passed the Act in response to a substantial number of infants having been made seriously ill in 1979 by the inadvertent omission of chlorides (essential nutrient for growth and development) in some infant formula when a manufacturer reformulated several of its infant formula products (61 FR 36153-36219, July 9, 1996).

¹⁴Lactose is a carbohydrate found in cow's milk.

infant formulas meet the nutritional needs of almost all infants" (65 FR 51213-51229, August 23, 2000). However, other types of infant formulas, including hypoallergenic and milk-based lactose-free, as well as formulas for infants with special nutritional needs, are also available. Infant formula is available in three different physical forms (liquid concentrate, powder, and ready-to-feed), in two different iron levels (added iron and low iron), and in a wide variety of package sizes.

Historically, the infant formula industry has been highly concentrated, with a small number of manufacturers. The manufacturers are usually owned by pharmaceutical companies, and those companies produce the vast majority of infant formula sold in the United States. In 1987 (i.e., before WIC's infant formula rebate programs were widely implemented), three manufacturers, all owned by pharmaceutical companies, accounted for 99 percent of the total U.S. market share of infant formula: Ross Labs, owned by Abbott Laboratories; Mead Johnson, owned by Bristol-Myers; and Wyeth-Ayerst Laboratories, owned by American Home Products (GAO, 1990) (table 2).

The fact that only a few firms produce infant formula for the U.S. market suggests that the costs of entering the market are high. It may be difficult for new firms, especially nonpharmaceutical firms, to enter because medical detailing is costly. According to the U.S. General Accounting Office, the practice of medical detailing by the pharmaceutical manufacturers of formula may have limited the ability of nonpharmaceutical companies to compete in the domestic infant formula market (GAO, 1990). Medical detailing is the manufacturer's practice of contacting hospitals and medical practitioners directly, providing them with free or discounted infant formula and encouraging physicians to recommend one particular brand of formula (GAO, 1990). Medical detailing also includes providing hospitals with "discharge packs" containing formula samples, cents-off coupons, and company advertising aimed at mothers when they leave the hospital with their babies; such activities may serve as implicit endorsement of a particular brand of infant formula by the hospital. To the extent that parents of formula-fed infants develop a strong brand loyalty, their responsiveness to price differentials across brands is reduced. Thus, medical detailing may provide some market power to pharmaceutical companies. Other types of companies do not have the personnel (especially personnel with physician contacts) to compete.

Breastfeeding Rates in the 1990s

Since 1955, the Ross Laboratories Mothers Survey, a large national mail survey of infant feeding practices conducted by the infant formula manufacturer, has been used to monitor breastfeeding trends in the United States. From 1990 to 1998, the initiation of breastfeeding (i.e., breastfeeding while in the hospital) increased by almost 25 percent (table 1). By 1998, 64.3 percent of women were initiating breastfeeding, the highest rate ever recorded. Rates of breastfeeding infants at 6 months of age increased by almost 63 percent over the same period, from 17.6 to 28.6 percent (breastfeeding women included those who breastfed exclusively as well as those who supplemented breast milk with infant formula or milk from other sources).

WIC participants showed even greater increases in the prevalence of breastfeeding during the 1990s (mothers who since the birth of their child, participated in WIC themselves, or whose child participated in the program, were considered to be WIC participants). The percentage of WIC participants who initiated breastfeeding increased by over 50 percent from 1990 to 1998, while the percentage who were breastfeeding at 6 months

increased by over 130 percent. Despite these gains, WIC participants are still less likely to breastfeed (both in the hospital and at 6 months) than non-WIC participants. However, historically, the more vulnerable and less affluent groups of mothers who are more likely to participate in WIC, including mothers who are black, poor, and have low education levels, have been less likely to breastfeed their children (Ryan, 1997).

Through its nutrition education and breastfeeding promotion programs, the WIC Program encourages mothers to breastfeed their infants if possible. In addition, breastfeeding women have a higher priority for certification into the program than nonbreastfeeding postpartum women and they are eligible to receive program benefits for up to 1 year postpartum (as long as they continue to breastfeed), as opposed to only 6 months of postpartum benefits for nonbreastfeeding women. The quantity and variety of food in the WIC supplemental food package for breastfeeding women are also greater than that for nonbreastfeeding women. Women who exclusively breastfeed their infants may receive an enhanced WIC food package.

Table 1—Breastfeeding rates by WIC status, 1990-98

WIC status	1990	1991	1992	1993	1994	1995	1996	1997	1998
	<i>Percent</i>								
In hospital:									
All infants	51.5	53.3	54.2	55.9	57.4	59.7	59.2	62.4	64.3
WIC	33.7	36.9	38.8	41.6	44.3	46.6	46.6	50.4	52.6
Non-WIC	62.9	65.2	66.4	67.9	68.8	71.0	70.8	73.4	75.2
At 6 months:									
All infants	17.6	18.2	18.9	19.0	19.7	21.6	21.7	26.0	28.6
WIC	8.2	9.0	10.1	10.8	11.6	12.7	12.9	16.5	18.9
Non-WIC	23.6	24.6	25.6	25.8	26.5	29.2	29.5	35.5	38.5

Source: Abbott Laboratories, 1998.

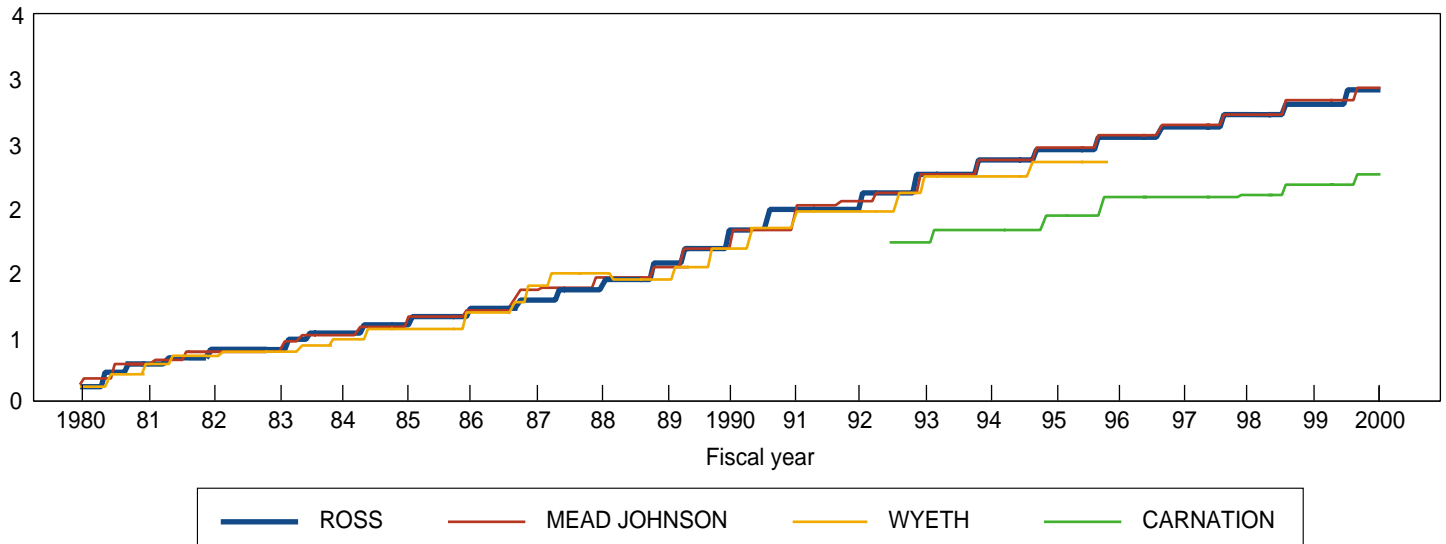
The industry's high concentration may also be a reflection of costs due to regulatory requirements of the Federal Food, Drug, and Cosmetic Act. For example, the Act requires demonstrating that infant formulas new to the U.S. market provide nutrients to the infant in usable form, and testing of every batch of infant for-

mula to ensure its nutrient composition. Finally, through a variety of practices, firms in concentrated markets are often able to charge higher prices, relative to production costs, than firms in less concentrated markets.

Figure 2

Wholesale prices of selected infant formula by manufacturer, 1980-2000

Dollars per can of 13-ounce milk-based liquid concentrate



Source: Data provided by USDA's Food and Nutrition Service.

Table 2—Share of the U.S. infant formula market by company, 1987, 1994, and 2000

Company	1987	1994	2000
	<i>Percent</i>		
Ross	55	53	35
Mead Johnson	35	27	52
Wyeth	9	9	NA
Carnation	NA	7	12
Gerber (Mead Johnson)	NA	3	NA
PBM (Wyeth)	NA	NA	1

NA = Not applicable.

Notes: Market share was determined by volume of infant formula sold. Companies accounting for less than 1 percent of the market are not identified. Infant formula sold under the Gerber name was manufactured by Mead Johnson. Infant formula sold by PBM was manufactured by Wyeth.

Sources: Data for 1987 are from GAO, 1990. Data for 1994 and 2000 are from ERS analysis of InfoScan data.

As large buyers, WIC State agencies can use their market power to obtain lower prices. In order to win a WIC contract, infant formula manufacturers may choose to sell infant formula at a loss in the WIC market. To be profitable, such a strategy requires that increased sales in the non-WIC market offset the loss in the WIC market. An increase in non-WIC market sales could take place if retail stores give more shelf space to the WIC brand of infant formula (since, on average, over half of all sales are through WIC) or if physicians or hospitals become more likely to recom-

mend the WIC brand of infant formula to non-WIC consumers. GAO concluded that since WIC comprises over half of the market, it is unlikely that infant formula manufacturers sell their product at a loss in the WIC market (GAO, 1998).

The U.S. infant formula market has undergone several changes since 1987, the most important of which has been the introduction of several lower priced infant formulas. For example, Carnation introduced their infant formula products into the U.S. market in 1988.¹⁵ Unlike the other major infant formula manufacturers, who are subsidiaries of pharmaceutical companies, Carnation is a subsidiary of Nestle, a large food company. It markets its formula directly to consumers rather than to medical professionals. Although the wholesale prices of infant formula charged by the other major manufacturers have historically been very similar, Carnation has offered its product at substantially lower wholesale prices (fig. 2). Carnation has steadily increased its share of the U.S. market. ERS analysis of scanner data indicates that in 2000, Carnation accounted for an estimated 12 percent of the market in volume sales.

¹⁵Carnation had been producing infant formula for the international market for many years prior to this time.

In 1989, Bristol-Myers (the parent company of Mead Johnson) entered into a marketing agreement with another a nonpharmaceutical company—Gerber Products Company (a large baby food producer), in which the formula was manufactured by Bristol-Myers but marketed under the Gerber name (Gerber, 1989).¹⁶ Gerber infant formula was generally priced below the leading brands and was marketed directly to consumers. The agreement ended in 1997 and the production of Gerber brand infant formula ceased (Mead Johnson, 1997).

After many years of producing infant formula for the U.S. market, Wyeth phased out production of its infant formulas for the U.S. market during 1996.¹⁷ Among the reasons the company cited for their exit from the domestic market were the increasing costs of competing in the overall nutrition market and the spiraling growth of the WIC program (Wyeth-Ayerst Laboratories, 1996). In 1997, Wyeth reentered the domestic infant formula market, not as a distributor of infant

¹⁶This was Gerber's second attempt to enter the infant formula market. Gerber produced an infant formula from 1967 until it was discontinued in 1972 (*New York Times*, 1989).

¹⁷Wyeth continued to manufacture infant formula for the international market.

formula but as a producer for PBM Products. PBM Products markets the formula under its own label as well as under private-label brands in such chains as Wal-Mart and Target at prices below the major brands (*Washington Post*, Sept. 11, 1999). Product marketing is aimed at consumers rather than the medical community (PBM does no medical detailing). Infant formula sold by PBM Products (virtually all of it in powdered form) accounted for just over 1 percent of the domestic market in 2000.¹⁸

Another change in the infant formula market has been the switch in market shares between Mead Johnson and Ross. Mead Johnson's share increased from 35 percent in 1987 to 52 percent in 2000 as their share of the WIC infant formula market almost tripled from 23 percent to 68 percent over the same period (see Appendix A). Meanwhile, Ross's share of the market declined from 55 percent in 1987 to 35 percent in 2000.

¹⁸According to ERS tabulations, PBM infant formula accounted for over 1 percent of all infant formula and 2 percent of powdered formula sold in 2000.

Source of Data

The data used for the analysis below comes from InfoScan, a scanner-based retail sales tracking service provided by Information Resources Incorporated. The data are projected to represent 100 percent of sales in U.S. supermarkets that have at least \$2 million in sales annually, in drugstores representing 100 percent of nonprescription sales, and in mass merchandiser stores belonging to chains that sell at least \$200 million annually.

InfoScan is based on weekly retail scanner information from a sample of 11,300 supermarkets, 7,500 drugstores, and 288 mass merchandisers across the United States. The retail stores in the sample are statistically selected and must meet strict data quality standards. Once a week, the sampled retailers provide retail scanner data, including the price and description of all products scanned in these stores during that week. In addition, an extensive network of professional field auditors collects weekly information on promotional activities from all sample stores. This information is used to differentiate everyday volume from volume due to promotional activity, as well as to quality-check the data and to ensure that changes in volume correlate to the relevant in-store promotional activity.

After the data are reviewed and checked for errors or inconsistencies, InfoScan applies projection factors to extrapolate total volume of product sold and total dollar sales of the product for chains, market areas, regions, and the total United States. Supermarket data are projected to 64 market areas (fig. 3). The market areas are sets of counties selected on the basis of their retail trading environment. The market area data are then combined with data from sample stores representing the counties outside the 64 market areas to project regional and national supermarket sales. Drug and mass merchandise sales projections are created in a similar manner, with the exception that local market areas are not projected; rather, individual store-level data are projected directly to eight standard regions, that, when combined, reflect the total for the United States.

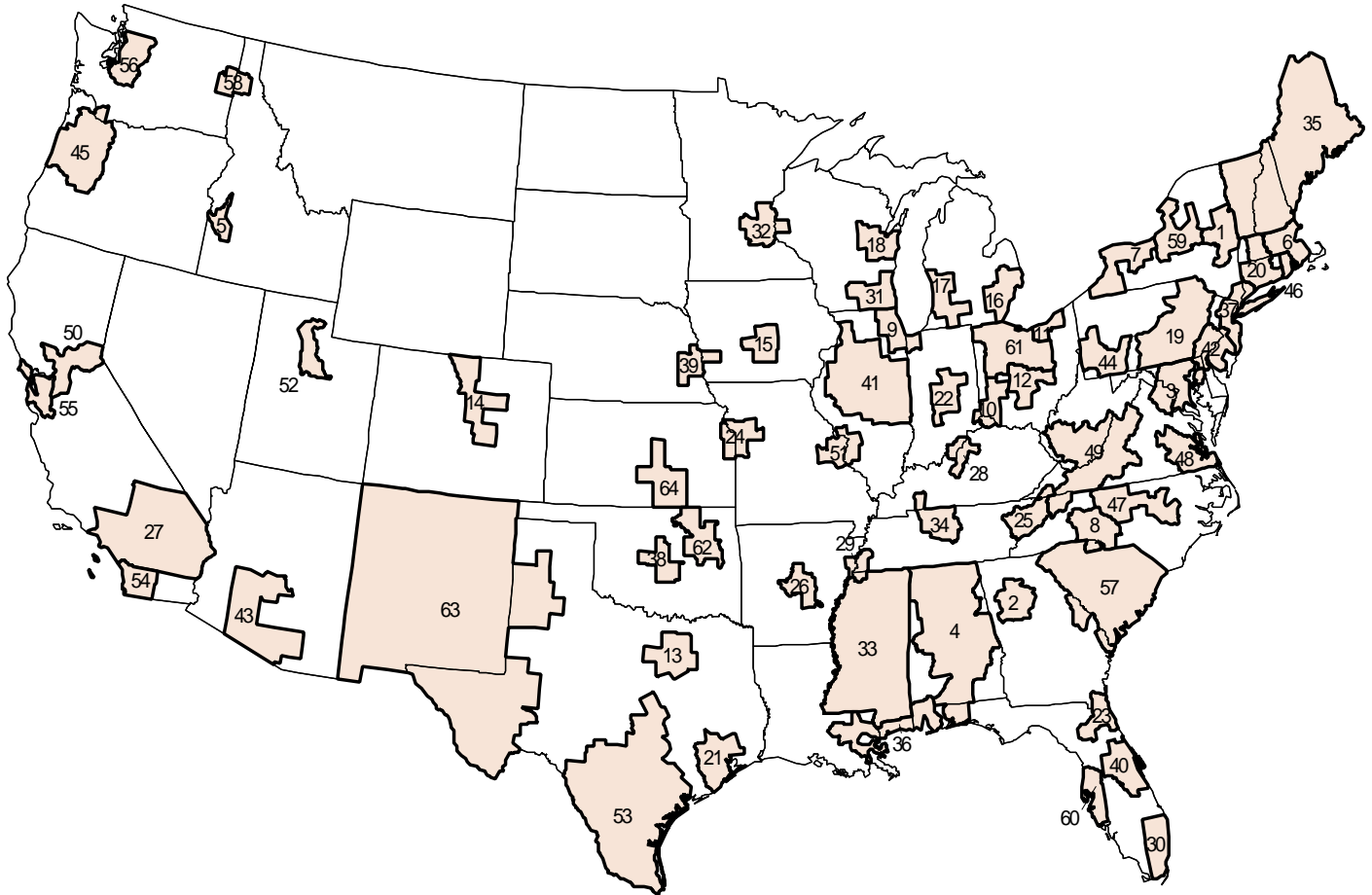
The InfoScan infant formula category includes information on dollar sales, unit sales, volume sales, and prices per unit for over 500 distinct items. These items are unique in terms of such characteristics as product brand, package size, product form, and product base and usually conform to a unique universal product

code (UPC). One exception to the correspondence of individual items and UPC codes is private-label items. In this case, items are grouped by unique package characteristics. Consequently, individual private-label brands or store labels are not identified. Fortunately, this does not create a problem for this study because PBM was the only company marketing private-label infant formula in 2000. As a result, InfoScan private-label infant formula as well as all infant formula identified as being manufactured by Wyeth was coded as PBM infant formula (all PBM infant formula is manufactured by Wyeth).

Each item in the infant formula category on the InfoScan data base was examined by ERS analysts and classified as to type: standard formula (382 items), specialized formula (58 items), or not infant formula (90 items). As defined in this report, standard infant formula includes milk-based and soy-based infant formulas, excluding specialized infant formula, that meet the nutritional needs of most full-term, healthy infants less than 1 year old. Specialized formula includes formula for children with special nutritional requirements, such as hypoallergenic formula, thickened formula, formula to treat diarrhea, formula for premature babies, formula for infants with other diseases or disorders such as PKU, as well as lactose-free (nonsoy) formula, and formula marketed to toddlers 1 year or older. The terms “standard” and “specialized” were developed for this report to categorize types of infant formula. They do not coincide with categories used either for the regulation of infant formula or in the administration of the WIC infant formula rebate program. Items determined not to be infant formula, such as Pedialyte and other electrolyte maintenance solutions, were excluded from this analysis. Each formula item was further classified as to the product base (milk, soy, or protein hydrolysate), and product form (liquid concentrate, powder, or ready to feed). ERS further processed the InfoScan data to convert the volume measures to single strength equivalents. Each ounce of liquid concentrate is equivalent to 2 ounces of ready-to-feed formula. Conversion factors for powder formula range from 7.08 to 7.5, depending on brand and product base.

Infant formula prices reported in this study are converted to apply to a standard unit of volume, 26 ounces of ready-to-feed formula. This volume was chosen as the standard because it is the ready-to-feed equivalent of a 13-ounce can of concentrate, the unit size used most often in other studies of infant formula pricing. This conversion allows one to easily compare retail

Figure 3
Market areas, 2000



1 Albany	23 Jacksonville	45 Portland,OR
2 Atlanta	24 Kansas City	46 Providence
3 Baltimore-Washington	25 Knoxville	47 Raleigh-Greensboro
4 Birmingham-Montgomery	26 Little Rock	48 Richmond-Norfolk
5 Boise	27 Los Angeles	49 Roanoke
6 Boston	28 Louisville	50 Sacramento
7 Buffalo-Rochester	29 Memphis	51 St. Louis
8 Charlotte	30 Miami-Ft. Lauderdale	52 Salt Lake City
9 Chicago	31 Milwaukee	53 San Antonio-Corpus Christi
10 Cincinnati-Dayton	32 Minneapolis-St. Paul	54 San Diego
11 Cleveland	33 Mississippi	55 San Francisco-Oakland
12 Columbus	34 Nashville	56 Seattle-Tacoma
13 Dallas-Ft. Worth	35 New England	57 South Carolina
14 Denver	36 New Orleans-Mobile	58 Spokane
15 Des Moines	37 New York	59 Syracuse
16 Detroit	38 Oklahoma city	60 Tampa-St. Petersburg
17 Grand Rapids	39 Omaha	61 Toledo
18 Green Bay	40 Orlando	62 Tulsa
19 Harrisburg-Scranton	41 Peoria-Springfield	63 West Texas-New Mexico
20 Hartford-Springfield	42 Philadelphia	64 Wichita
21 Houston	43 Phoenix-Tuscon	
22 Indianapolis	44 Pittsburgh	

Source: Information Resources Incorporated.

costs for different package sizes and product forms. The price is calculated by dividing dollar sales by volume sales in single-strength, ready-to-feed equivalents. This procedure creates a volume-weighted average price. Infant formula sales and volume figures for year 2000 are annualized based on data available from InfoScan for the first three quarters of the year, the most recent data available at the time the study was initiated.

Limitations of the Data

The InfoScan data are not available at the State level. In some cases, the 64 market areas span State boundaries. Whereas 41 of the 64 market areas fall within the boundaries of a single State, the remaining 23 cover more than one State (e.g., the Philadelphia market area includes parts of Pennsylvania, New Jersey, Delaware, and Maryland). Seven States—Alaska, Hawaii, Montana, Nevada, North Dakota, South Dakota, and Wyoming—are not included in any of the 64 market areas.

Another limitation of the data for this study is that only supermarket data are projected to the market area level; sales data from drug stores and mass merchan-

disers are available at the national level only. Drug stores and mass merchandisers account for a considerable—and increasing—proportion of all infant formula sales, amounting to nearly 29 percent of dollar sales and 32 percent of volume sales of all infant formula in 2000.

InfoScan data do not measure sales in convenience and food stores with less than \$2 million in sales annually and nonfood stores that sell baby food, such as Toys R Us. In addition, consumers can now order infant formula through the Internet, often at a discount. The contribution of these other outlets of infant formula to total volume sales or prices is unknown, but it is believed to account for only a small proportion of overall sales of infant formula in the United States.

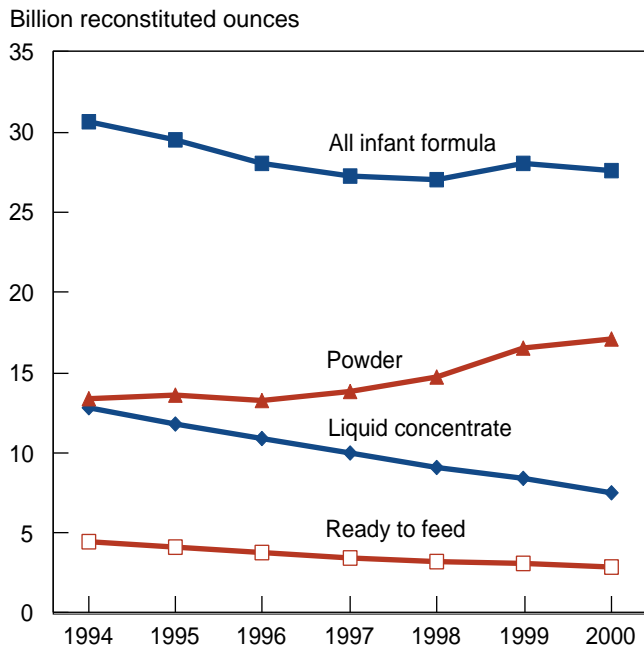
This study's analysis of InfoScan data was limited to the years 1994 through 2000. Prior to 1994, information on mass merchandisers was not collected. 1994 also marked the first year that all WIC State agencies (excluding Indian State agencies with 1,000 or fewer participants) with infant formula rebate operations switched to sole-source competitive rebate systems (see Appendix A).

Availability of Infant Formula

Examination of InfoScan data from 1994 to 2000 reveals several recent trends in the infant formula market. The total volume of infant formula sold in the United States (measured in reconstituted ounces) decreased by 10 percent between 1994 and 2000, mostly between 1994 and 1997 (fig. 4).¹⁹ Since 1997, the volume of infant formula sold in this country has remained relatively stable at about 27 to 28 billion ounces per year. While the total volume of infant formula has decreased, the volume of infant formula sold in powdered form has grown dramatically, so that it accounted for 62 percent of all formula sold in 2000 compared with 43 percent in 1994. Over the same period, liquid concentrate decreased from 42 to 27 percent of all formula sold, and ready-to-feed decreased from 14 to 11 percent.

Most infant formula is sold in supermarkets (69 percent in 2000) (fig. 5). However, in recent years, the

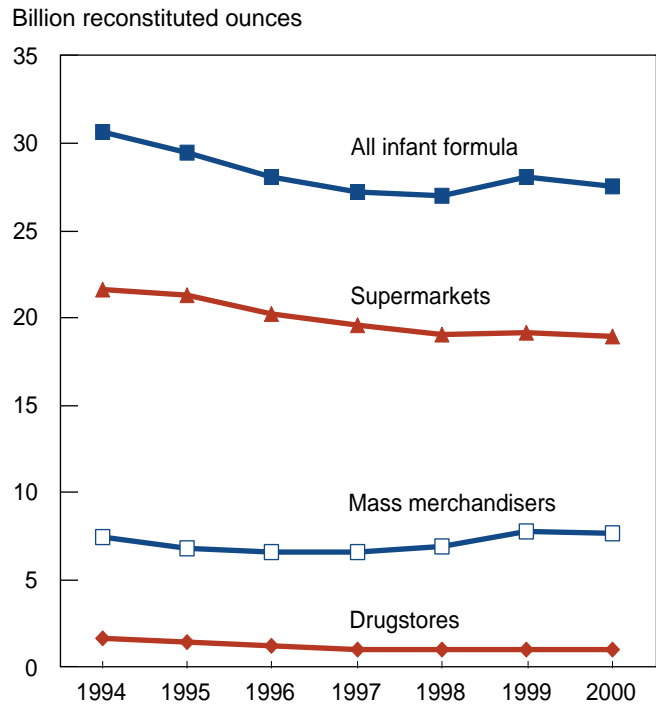
Figure 4
Volume of all infant formula sold in the United States by physical form, 1994-2000



Source: ERS analysis of InfoScan data.

¹⁹A possible factor contributing to the decrease in volume of infant formula sold was the continuing increase in breastfeeding rates during this period (see table 1). In addition, the number of live births in the United States decreased by almost 2 percent between 1994 and 1997 before increasing in 1998 and 1999 (U.S. Department of Health and Human Services, various years).

Figure 5
Volume of all infant formula sold in the United States by outlet, 1994-2000



Source: ERS analysis of InfoScan data.

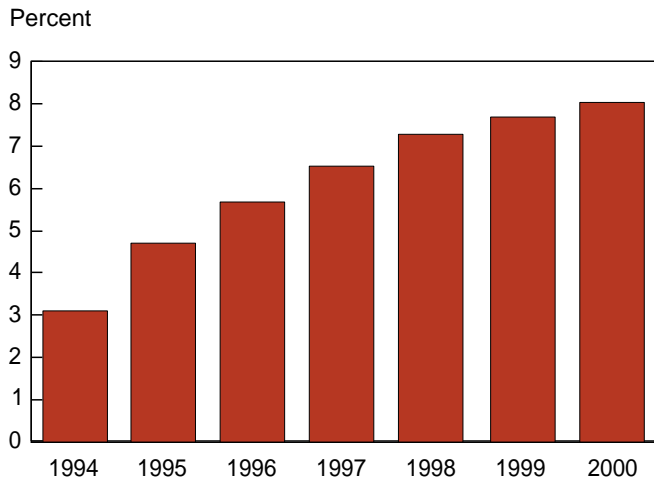
proportion of infant formula sold by mass merchandisers has increased slightly relative to both supermarkets and drugstores. In 2000, mass merchandisers accounted for about 28 percent of total volume sold, while drugstores accounted for less than 4 percent.

Another recent trend in the infant formula market is the increased use of “specialized” infant formulas. The proportion of infant formula that is specialized increased from 3 percent in 1994 to over 8 percent in 2000 (fig. 6).

While the volume of infant formula sold has decreased over time, total dollar sales increased by almost 13 percent between 1994 and 2000 (fig. 7). By 2000, sales of infant formula totaled over \$2.9 billion. Dollar sales of specialized formula increased by 149 percent during this period, compared with only 6 percent for standard formula. Similar to the results found for volume sales of infant formula, dollar sales of powdered formula and formula sold by mass merchandisers increased relative to the other physical forms of formula and outlet types over the 1994-2000 period.

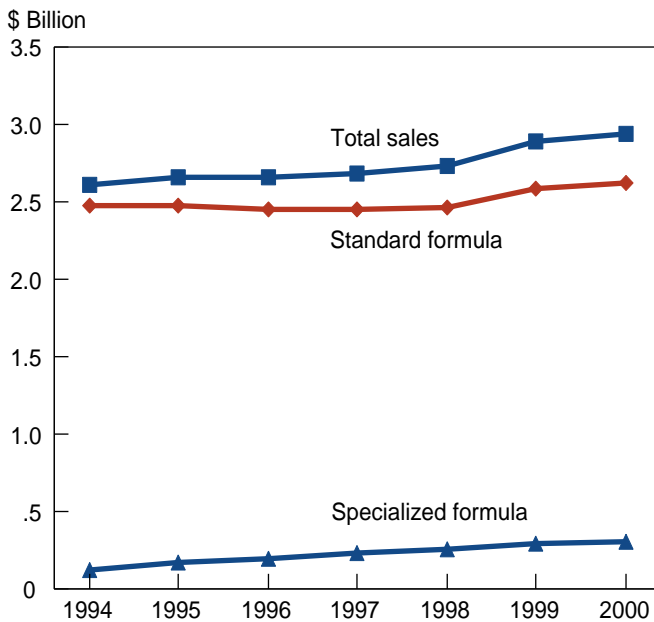
The increase in dollar sales of infant formula at the same time that the volume sold was declining reflects

Figure 6
Specialized infant formula as a proportion of all infant formula sold in the United States, 1994-2000



Source: ERS analysis of InfoScan data.

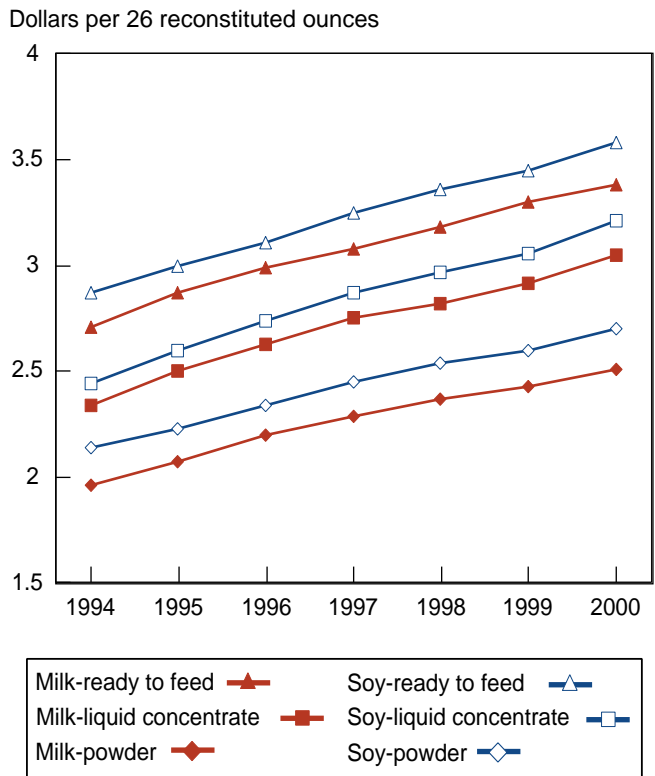
Figure 7
U.S. sales of infant formula by type, 1994-2000



Note: Data are reported in nominal dollars.
 Source: ERS analysis of InfoScan data.

the increase in retail prices over time. The price increase was similar across the major types of infant formula (fig. 8). In general, soy-based formula (on a reconstituted basis) cost more than milk-based formula, and ready-to-feed cost more than liquid concentrate, which cost more than powder.

Figure 8
Average U.S. price of infant formula by product base and form, 1994-2000



Note: Data are reported in nominal dollars.
 Source: ERS analysis of InfoScan data.

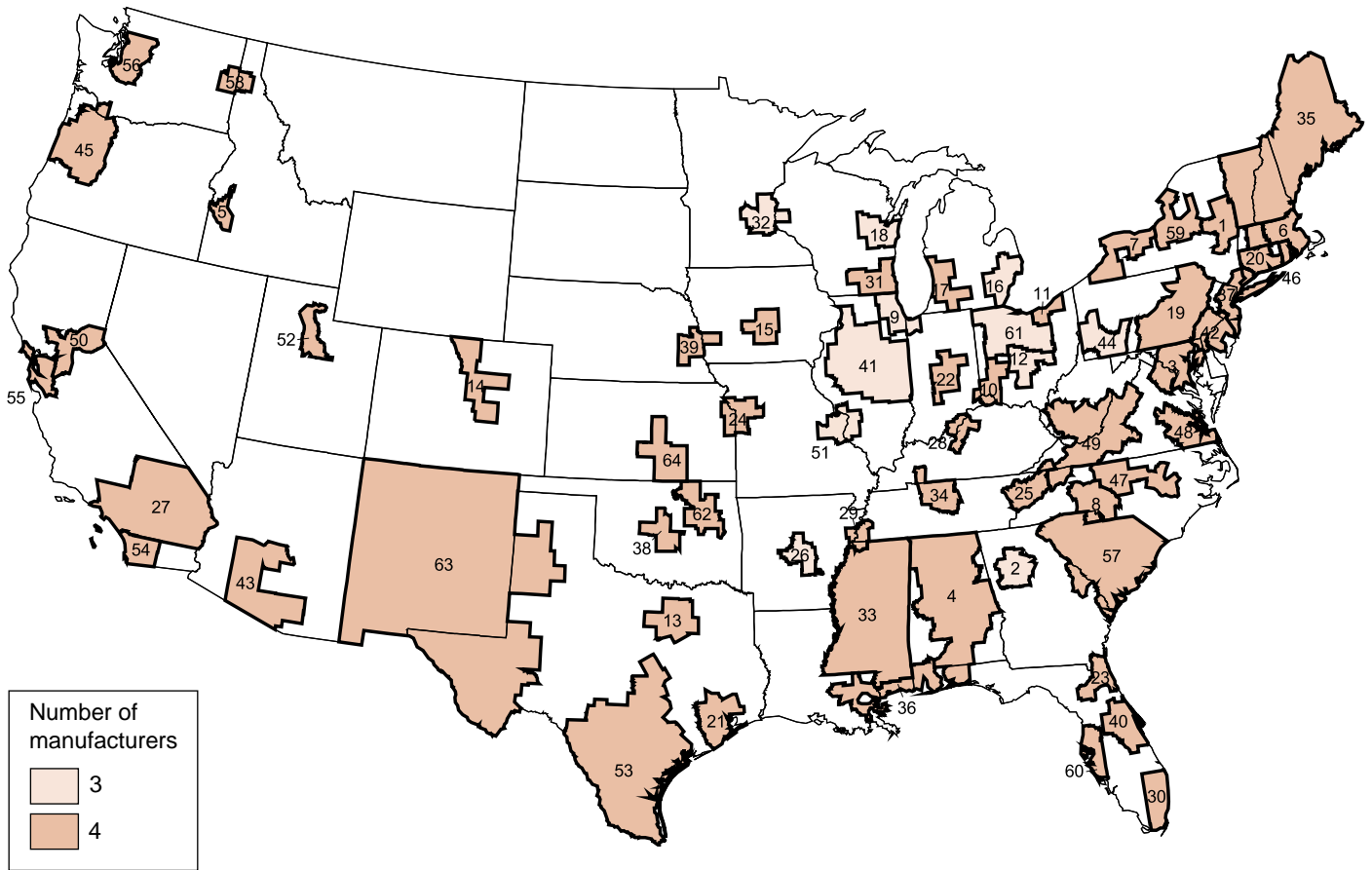
InfoScan data on the volume sales of infant formula in supermarkets by company were available for the 64 local market areas.²⁰ The data indicate that formulas produced by Mead Johnson, Ross, and Carnation were available in all 64 market areas in 2000.²¹ Formula produced by Wyeth but sold in supermarkets by the new marketing firm PBM Products was available in 53 of the 64 of the market areas (83 percent) (fig. 9). However, data based solely on supermarket sales may underestimate the availability of PBM Products. Unlike the other manufacturers of infant formula, PBM sells a larger proportion of its formula through mass merchandisers and drugstores (41 percent in 2000) relative to the industry as a whole (31 percent).

²⁰About 69 percent of all infant formula was sold in supermarkets in 2000.

²¹Availability was determined by whether any of that company's formula was sold in the area. Data on the number of supermarkets in which the product was sold were not available.

Figure 9

Number of standard milk-based infant formula powder manufacturers with products in supermarkets, 2000



Note: Numerical identifiers of markets are provided in figure 3.
Source: ERS Analysis of Infoscan Supermarket Data, 2000.

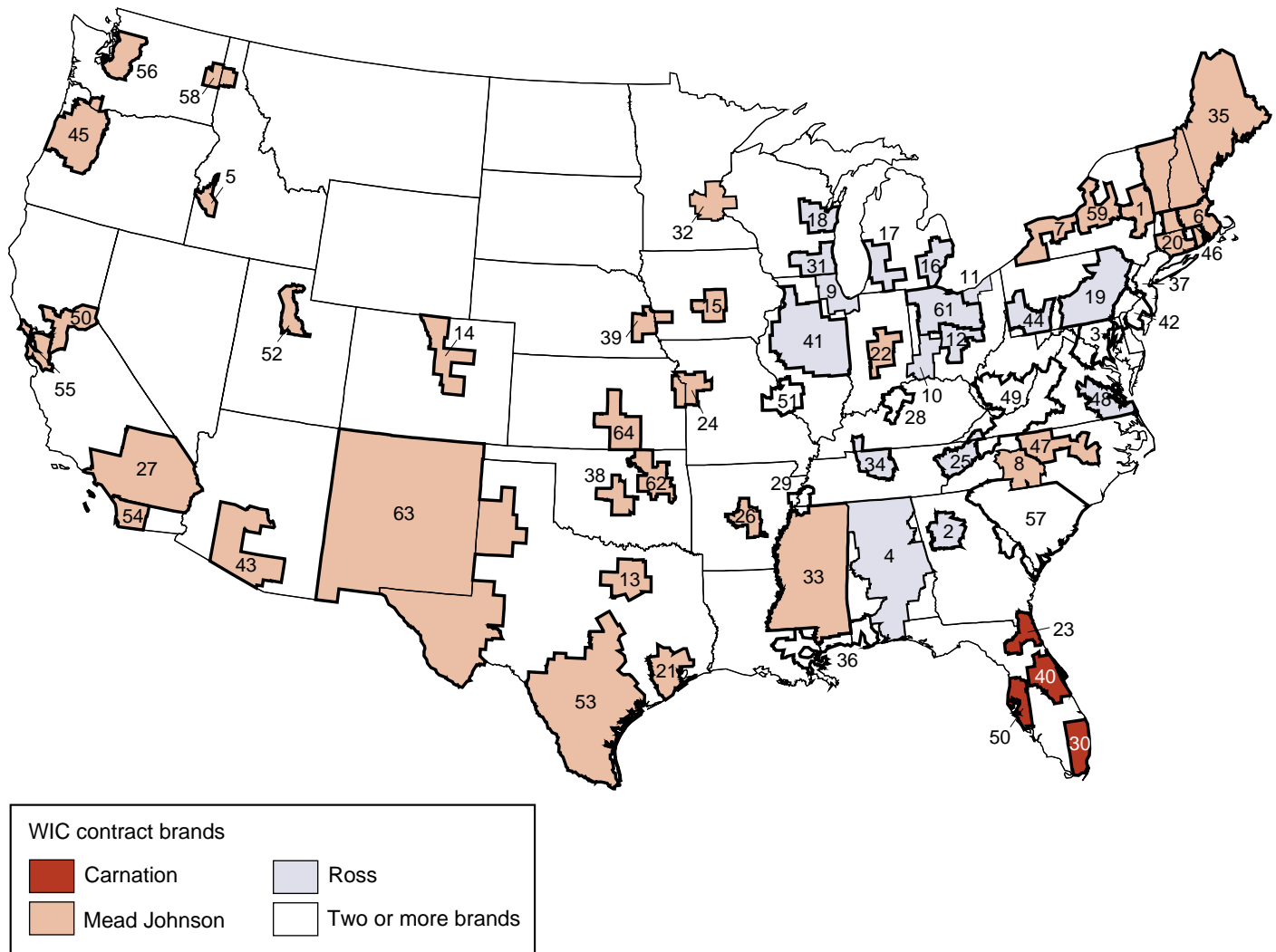
Retail Price of Infant Formula

The examination of infant formula prices in this report was confined to milk-based “standard” formula in liquid concentrate and powder forms. Although prices vary by form and size, these are the most common products sold and are representative of pricing patterns found for other infant formula products. Milk-based infant formula currently accounts for 77 percent of all infant formula sold, and standard formulas account for more than 91 percent of all formula sold in this country. Standard infant formula excludes specialized formulas that are generally, but not always, more expen-

sive than standard formulas.²² The use of the term “specialized formula” in this study does not necessarily mean that it is not available to WIC recipients or is available only with a medical diagnosis warranting a specific brand of formula. Rather, it was developed for use in the study’s examination of prices of infant formula in order to compare similar types of conventional formulas and/or formulas with similar price structures. The inclusion of several higher price specialized for-

²²Because the data set used in the analysis did not allow us to determine the iron content of many formulas, we included low-iron formula in our definition of standard formula. In general, there is little price variation between iron and low-iron formulas and the examination of data for major brands, where available, suggests that low-iron formula accounts for only a small portion of all infant formulas.

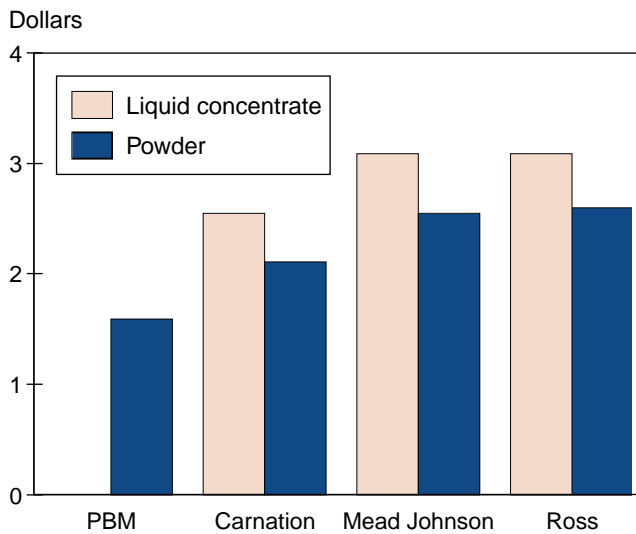
Figure 10
WIC infant formula contract brand by market area, 2000



Note: Numerical identifiers of markets are provided in figure 3.
Source: ERS Analysis of FNS WIC contracts.

Figure 11

Average retail price of standard milk-based infant formula in supermarkets by company and product form, 2000



Note: PBM infant formula is manufactured by Wyeth.
 Source: ERS analysis of InfoScan data.

mulas produced by a specific manufacturer could bias the results of the study.

Two different physical forms were examined—milk-based powder in 12- to 32-ounce containers and milk-based liquid concentrate in 13-ounce cans. The data represent supermarkets, which account for 69 percent of all infant formula sold by volume. Information on the retail price of infant formula by market area is not available for drugstores or mass merchandisers. These two types of formulas—standard milk-based powder in 12- to 32-ounce containers sold in supermarkets (30.3 percent) and standard milk-based liquid concentrate in 13-ounce cans sold in supermarkets (15.6 percent) accounted for almost 46 percent of all infant formula sold by volume in 2000.

The InfoScan data contained price information for 64 market areas. Of those areas, 23 spanned 2 or more States. In some of those multistate areas, the WIC contract brand was the same throughout the market area. In others, a different WIC contract brand comprised only a small share of the market area. Since the objective of this analysis is to compare the cost of WIC contract brand infant formula with other brands of infant formula, those market areas located in two or more States with different WIC contract-winning manufacturers present a problem in identifying the WIC contract brand of infant formula. The criterion for including a multistate market area in this analysis was that a market area have at least 90 percent of the area’s popu-

lation in an area that had the same WIC contract brand throughout the reference period, which ran from January 2000 through September 2000.²³ Of the 64 market areas, 55 met this criterion; it was not possible to assign a “WIC brand” to the remaining 9 market areas (fig. 10).

Milk-Based Liquid Concentrate

Retail prices of standard milk-based infant formula sold in supermarkets varied by company and product form (fig. 11). The price of PBM and Carnation brand infant formula was, on average, considerably lower than for that manufactured by Mead Johnson and Ross. The comparison of the average retail price of WIC contract brand and other brands of milk-based liquid concentrate infant formula by market area is shown in table 3. Because the data did not identify any PBM Products in liquid concentrate, only three companies—Ross, Mead Johnson, and Carnation—were represented. In all 55 market areas in which a WIC brand was designated, Carnation brand formula had the lowest retail prices. The company producing the highest priced formula varied between Ross and Mead Johnson. There was not a clear relationship between being the WIC contract brand of formula and having the highest average retail price. In 28 of the 55 market areas with a designated WIC contractor (51 percent), the WIC contract brand of infant formula was the highest priced formula, and in an additional 5 market areas it tied for the highest price. In the remaining 22 market areas, the WIC contract brand was not the highest-priced infant formula.

Milk-Based Powder Formula

Table 4 shows the average retail price of standard milk-based powdered infant formula sold in supermarkets by the three previous companies and PBM Products (manufactured by Wyeth), by market area. In all 55 market areas examined, PBM Products had the lowest retail price, and in 54 of these market areas, Carnation brand formula had the next lowest. Ross brand formula was the highest priced formula in 48 of the 55 market areas. As with liquid concentrate, there was no apparent relationship between a formula’s being the WIC contract brand and having the highest average retail price. In 22 of the 55 market areas (40 percent), the WIC contract brand of infant formula was the highest priced formula, and it tied for the highest price in one other market area.

²³Geocoding analysis was used to estimate the proportion of the population within each market area that resided in specific States.

Table 3—Infant formula retail prices: Standard, 13-ounce cans of milk-based liquid concentrate in supermarkets by market area, 2000¹

Market area	Carnation	Mead Johnson	Ross	Average
	<i>Dollars per can</i>			
Albany	2.39	2.55	2.42	2.55
Atlanta	2.29	2.99	3.12	3.09
Baltimore/Washington	2.24	3.09	2.96	3.07
Birmingham/Montgomery	2.47	3.15	3.17	3.15
Boise	2.39	3.12	3.22	3.07
Boston	2.26	2.86	2.94	2.83
Buffalo/Rochester	2.42	2.86	2.78	2.83
Charlotte	2.29	3.02	3.04	2.99
Chicago	2.65	3.28	3.46	3.41
Cincinnati/Dayton	2.11	2.70	2.91	2.89
Cleveland	2.37	2.76	2.89	2.83
Columbus	2.39	2.91	2.99	2.96
Dallas/Ft. Worth	2.42	3.12	3.22	3.09
Denver	2.42	3.02	2.86	2.96
Des Moines	2.39	3.22	3.30	3.20
Detroit	2.39	3.15	3.15	3.09
Grand Rapids	2.21	2.60	2.94	2.89
Green Bay	2.29	3.25	3.28	3.20
Harrisburg/Scranton	2.26	2.94	2.91	2.89
Hartford/Springfield	2.31	2.96	3.04	2.96
Houston	2.26	2.99	3.07	2.96
Indianapolis	2.42	2.94	2.89	2.94
Jacksonville	2.55	3.02	3.07	2.65
Kansas City	2.42	3.17	2.91	3.15
Knoxville	2.24	2.94	2.96	2.96
Little Rock	2.50	3.48	3.48	3.48
Los Angeles	2.44	3.54	3.35	3.48
Louisville	2.37	2.86	2.91	2.91
Memphis	2.47	3.56	3.61	3.59
Miami/Ft. Lauderdale	2.70	3.12	3.17	2.81
Milwaukee	2.34	3.33	3.25	3.20
Minneapolis/St. Paul	2.34	3.15	3.17	3.09
Mississippi	2.37	3.25	3.35	3.22

See footnotes at the end of table.

Continued—

Table 3—Infant formula retail prices: Standard, 13-ounce cans of milk-based liquid concentrate in supermarkets by market area, 2000¹—Continued

Market area	Carnation	Mead Johnson	Ross	Average
	<i>Dollars per can</i>			
Nashville	2.29	3.15	3.15	3.15
New England	2.39	2.78	2.68	2.76
New Orleans/Mobile	2.52	3.38	3.30	3.33
New York	2.39	3.17	3.09	2.91
Oklahoma City	2.37	3.09	3.17	3.09
Omaha	2.34	3.04	2.86	2.96
Orlando	2.70	3.20	3.20	2.78
Peoria/Springfield	2.34	3.04	3.09	3.07
Philadelphia	2.55	3.02	3.12	2.96
Phoenix/Tucson	2.24	2.76	2.81	2.70
Pittsburgh	2.31	2.76	2.81	2.76
Portland, Oregon	2.60	3.69	3.28	3.59
Providence	2.39	2.86	3.04	2.86
Raleigh/Greensboro	2.26	2.96	2.96	2.96
Richmond/Norfolk	2.29	2.99	2.96	2.91
Roanoke	2.34	3.07	2.96	2.96
Sacramento	2.26	3.41	3.28	3.33
St. Louis	2.60	3.15	3.30	3.17
Salt Lake City	2.70	3.38	3.30	3.30
San Antonio/Corpus Christi	2.26	2.96	2.96	2.94
San Diego	2.42	3.59	3.33	3.51
San Francisco/Oakland	2.31	3.12	3.30	3.09
Seattle/Tacoma	2.52	3.09	3.04	3.07
South Carolina	2.29	3.02	3.09	3.04
Spokane	2.31	2.99	3.04	2.94
Syracuse	2.39	2.76	2.73	2.76
Tampa/St. Petersburg	2.65	3.09	3.12	2.73
Toledo	2.39	2.96	3.07	3.02
Tulsa	2.39	3.12	3.28	3.07
West Texas/New Mexico	2.55	3.33	3.17	3.33
Wichita	2.52	3.02	2.96	2.99
U.S. average	2.55	3.09	3.09	3.04

¹Numbers in color indicate WIC contract brand. Average refers to volume-weighted average.
Source: ERS tabulations of InfoScan supermarket data.

Table 4—Infant formula prices: Standard, 12-32-ounce cans of milk-based powder in supermarkets by market area, 2000¹

Market area	PBM (Wyeth)	Carnation	Mead Johnson	Ross	Average
<i>Dollars per 26 ounces reconstituted</i>					
Albany	1.72	2.00	1.98	2.29	2.03
Atlanta	NA	2.00	2.44	2.63	2.52
Baltimore/Washington	1.51	1.98	2.52	2.60	2.50
Birmingham/Montgomery	1.79	2.13	2.52	2.65	2.44
Boise	1.53	1.92	2.31	2.52	2.21
Boston	1.74	2.05	2.29	2.47	2.29
Buffalo/Rochester	1.43	2.00	2.21	2.31	2.21
Charlotte	1.48	1.95	2.50	2.55	2.44
Chicago	NA	2.34	2.96	2.89	2.83
Cincinnati/Dayton	1.74	1.90	2.21	2.44	2.31
Cleveland	1.61	2.05	2.37	2.50	2.42
Columbus	NA	2.00	2.39	2.52	2.44
Dallas/Ft. Worth	1.64	2.13	2.52	2.68	2.52
Denver	1.51	2.11	2.57	2.52	2.55
Des Moines	1.66	2.11	2.68	2.70	2.63
Detroit	NA	2.03	2.52	2.70	2.55
Grand Rapids	1.64	1.95	2.13	2.34	2.29
Green Bay	NA	2.16	2.78	2.86	2.78
Harrisburg/Scranton	1.51	2.00	2.37	2.55	2.44
Hartford/Springfield	1.74	2.05	2.42	2.52	2.42
Houston	1.61	2.03	2.47	2.65	2.47
Indianapolis	1.74	2.16	2.42	2.42	2.42
Jacksonville	1.56	2.13	2.52	2.57	2.29
Kansas City	1.59	2.13	2.65	2.47	2.63
Knoxville	1.43	1.95	2.47	2.60	2.52
Little Rock	NA	2.16	2.70	2.81	2.68
Los Angeles	1.61	2.11	2.83	2.78	2.78
Louisville	1.53	1.87	2.37	2.42	2.34
Memphis	1.64	2.13	2.78	2.91	2.83
Miami/Ft. Lauderdale	1.64	2.29	2.55	2.63	2.42
Milwaukee	1.53	2.11	2.65	2.76	2.68
Minneapolis/St. Paul	NA	2.03	2.42	2.55	2.39
Mississippi	1.61	2.13	2.57	2.81	2.57

See footnotes at the end of table.

Continued—

Table 4—Infant formula prices: Standard 12-32-ounce cans of milk-based powder in supermarkets by market area, 2000¹—Continued

Market area	PBM (Wyeth)	Carnation	Mead Johnson	Ross	Average
<i>Dollars per 26 ounces reconstituted</i>					
Nashville	1.51	1.98	2.47	2.70	2.65
New England	1.74	2.05	2.16	2.42	2.21
New Orleans/Mobile	1.59	2.13	2.73	2.68	2.65
New York	1.72	2.11	2.47	2.55	2.39
Oklahoma City	1.64	2.13	2.63	2.73	2.60
Omaha	1.61	2.03	2.52	2.60	2.47
Orlando	1.64	2.24	2.57	2.63	2.37
Peoria/Springfield	NA	2.18	2.37	2.65	2.60
Philadelphia	1.82	2.08	2.42	2.60	2.42
Phoenix/Tucson	1.64	1.92	2.26	2.37	2.24
Pittsburgh	NA	2.11	2.42	2.47	2.42
Portland	1.61	2.24	2.65	2.70	2.60
Providence	1.74	2.05	2.26	2.44	2.26
Raleigh/Greensboro	1.48	1.95	2.50	2.55	2.44
Richmond/Norfolk	1.51	1.95	2.50	2.57	2.44
Roanoke	1.48	2.03	2.55	2.60	2.47
Sacramento	1.69	2.08	2.81	2.65	2.70
St. Louis	NA	2.37	2.47	2.65	2.50
Salt Lake City	1.56	2.16	2.63	2.65	2.57
San Antonio/Corpus Christi	1.59	2.05	2.29	2.52	2.29
San Diego	1.61	2.11	2.68	2.76	2.63
San Francisco/Oakland	1.69	2.18	2.63	2.70	2.60
Seattle/Tacoma	1.69	1.95	2.50	2.52	2.44
South Carolina	1.51	1.98	2.47	2.57	2.47
Spokane	1.66	1.92	2.44	2.52	2.39
Syracuse	1.40	2.05	2.11	2.34	2.13
Tampa/St. Petersburg	1.64	2.26	2.52	2.65	2.34
Toledo	NA	2.08	2.42	2.57	2.47
Tulsa	1.64	2.13	2.60	2.73	2.57
West Texas/New Mexico	1.66	2.21	2.78	2.73	2.78
Wichita	1.64	2.13	2.60	2.18	2.50
U.S. average	1.59	2.11	2.55	2.60	2.52

NA = Not applicable.

¹Numbers in color indicate WIC contract brand. Average refers to volume-weighted average.

Source: ERS tabulations of InfoScan supermarket data.

Conclusions

This report presents the results of the preliminary analysis of the infant formula market and the retail prices of infant formula. Congress has expressed concern that since the WIC infant formula rebates began, “the number of suppliers has declined dramatically” (H.R. 106-157). However, the analysis indicates that, in both 1987 and 2000, three manufacturers accounted for about 99 percent of all infant formula sold in the United States. In both years, two companies—Mead Johnson and Ross—accounted for between 87 and 90 percent of total infant formula sold. The third largest producer in 2000, Carnation, entered the U.S. market after the rebate programs began. Carnation, and PBM Products, the newest entrant into the domestic infant formula market, rely on direct consumer marketing and provide lower priced alternatives to the major brands of formula sold in the United States. Although Carnation accounts for only 6 percent of the WIC infant formula market by volume sold, its share of the

non-WIC market is estimated at roughly 18 percent.²⁴ The data indicate that along with Mead Johnson and Ross brands, Carnation brand infant formula is available in supermarkets throughout the United States, and formula manufactured by Wyeth and sold by PBM Products is available in supermarkets in most areas of the country.

Congress also directed ERS to compare the cost of formula included in the WIC rebate program with the cost of formula that is not included. Preliminary results indicate that within market areas, there is not a clear relationship between a formula’s being the WIC contract brand and its having the highest average retail price. Continuing analyses of the cost of infant formula will focus on: (1) the retail price of infant formula over the 1994-2000 period; (2) the relationship of retail to wholesale prices for infant formula; and (3) the factors affecting retail prices.

²⁴Since WIC accounts for over half of all infant formula sold in the United States, and Carnation accounts for only 6 percent of the WIC infant formula market (see Appendix A), Carnation’s share of the non-WIC market is at least 18 percent.

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Appendix A—History of the WIC Infant Formula Rebate Program

Several States have engaged in infant formula cost containment practices since WIC's establishment in the early 1970s (Harvey et al., 1988). For example, Vermont, which uses a home delivery system to distribute WIC foods, has always used competitive bidding to purchase infant formula for its WIC program. Mississippi, which uses a direct distribution system for WIC foods, purchased infant formula in bulk in order to take advantage of available discounts.²⁵ However, the other States, all of which use retail purchase systems to distribute WIC foods, purchased infant formula at full retail prices prior to 1987.²⁶

In the mid-1980s several factors prompted the States with retail purchase systems to look into alternative ways to reduce infant formula costs: (1) nearly 40 percent of total WIC food costs were attributed to infant formula; (2) formula prices grew faster than overall food prices; and (3) the infant formula industry structure suggested that cost containment initiatives could be successful (GAO, 1990). Tennessee became the first State with a retail purchase food delivery system to implement a rebate system to control costs associated with infant formula when it awarded a competitively bid single-source exclusive contract in June 1987. Significantly, the contract was awarded to Wyeth Laboratories (the only company to submit a bid), who—since it accounted for only a small portion of the infant formula market—had the most to gain from winning a sole-source contract (Post and Wubberhorst, 1989). In December 1987, Oregon became the second State to implement a competitively bid single-source exclusive contract. The contract was awarded to Wyeth Laboratories, which was once again the only company to submit a bid (GAO, 1990).

In late 1987 and early 1988, Florida, Michigan, and Wyoming instituted an alternative infant formula cost containment strategy, known as the “open market” system. Under this system, there were no sealed bids or exclusive contracts. Rather, infant formula manufacturers voluntarily agreed to provide a rebate to the State

²⁵In 1984, Mississippi began using competitive bidding (with the low bidder winning the contract) to purchase its infant formula for WIC (Harvey et al., 1988).

²⁶In the past, parts of Ohio and Maryland also used the home delivery system to distribute WIC foods. These areas used competitive bidding to award delivery contracts to the WIC vendors. These vendors in turn, tried to purchase the infant formula at the lowest cost (Harvey et al., 1988).

for their share of infant formula purchased through WIC (Center on Budget and Policy Priorities, 1995). However, WIC participants could still choose formula of manufacturers that chose not to provide a rebate. In spring of 1988, Texas awarded a competitive bid single-source exclusive contract, which was the first to be bid on by more than one manufacturer (GAO, 1990).

On October 1, 1988, P.L. 100-460 required that all State WIC agencies explore the feasibility of implementing cost containment procedures for acquiring infant formula, and if the procedures were determined to lower costs, begin implementing the cost containment system within a year. Although States had the option of using a home delivery system (Vermont) or direct distribution system (Mississippi) to reduce costs, most found these to be infeasible due to the costs associated with administering the program systems or because of their impact on participants (USDA, 1991). By late 1989, 57 State WIC agencies had implemented infant formula rebate contracts, 35 used the open market system, 19 used the competitive sole-source system, and 3 used a competitive multisource rebate approach (GAO, 1990).²⁷ Savings under the open market system, in which no sealed bids were submitted and the low bidder did not win an exclusive contract, resulted in lower savings than under competitive bidding.²⁸ The greater savings realized under the competitive bidding system were attributed to the lack of strong inherent pressure for price competition in the infant formula industry (GAO, 1990).²⁹

On November 10, 1989, P.L. 101-147 required States to use competitive bidding or an alternate method that yielded savings equal to or greater than that produced by competitive bidding to procure infant formula

²⁷Under the competitive multisource rebate system, contracts were awarded to the best bidder and any other bidders who met specified minimum bid criteria (GAO, 1990).

²⁸An analysis by GAO found that after statistically controlling for other factors, competitive sole-source contracts resulted in prices (for a 13-ounce can of milk-based infant formula) that were \$0.36 lower than that of open market contracts (GAO, 1990).

²⁹GAO states that the natural pressures for price competition between infant formula manufacturers are limited in the absence of competitively bid contracts due to: (1) the small number of infant formula producers; (2) the difficulty new competitors face in entering the domestic market; and (3) consumer selection of infant formula brands that may be relatively unresponsive to price differences among the brands (GAO, 1990).

(Indian State agencies with 1,000 or fewer WIC participants are exempted from this requirement). Competitive bidding was defined as a procurement process in which the State WIC agency selects the single source (i.e., infant formula manufacturer) offering the lowest price for the infant formula, as determined by the submission of sealed bids.³⁰

Since the infant formula market was dominated by a small number of manufacturers, there was concern that coordination of pricing strategies between the manufacturers was leading to high infant formula prices and large profits for the producers. In May 1990, the Senate Subcommittee on Antitrust, Monopolies, and Business Rights held a hearing on the pricing behavior of infant formula companies. At the hearing, the Chairman, Senator Howard Metzenbaum, referred to the formula companies' "campaign to undermine cost containment efforts" in the WIC program as an example of the attempts of producers to "push prices higher" (U.S. Senate, 1990). At about that time, the Federal Trade Commission (FTC) began investigating potential anticompetitive practices in the infant formula industry. In June 1992, the FTC brought charges against the three largest domestic manufacturers of infant formula—Abbott Laboratories (parent company of Ross), Mead Johnson, and American Home Products (parent company of Wyeth)—alleging bid-rigging in connection with a WIC contract to provide infant formula in Puerto Rico (Federal Trade Commission, 1993). Mead Johnson and American Home Products agreed to settle charges by providing 3.6 million pounds of free infant formula to the WIC program (Mauskopf and Dean, 1990). In May 1994, the court ruled in favor of Abbott Laboratories (853 Federal Supplement 526, May 27, 1994).

The original cost containment regulations published in 1989 required States to use competitive bidding to obtain infant formula, with the manufacturer offering the "lowest price" being awarded the contract. Historically, States awarded infant formula contracts to the bidder offering the lowest net costs (that is, the difference between the manufacturer's wholesale price for infant formula and the rebate offered to the State).³¹ However, in the mid-1990s, several States began

³⁰The best bid was determined by either the lowest net cost of infant formula or the highest rebate.

³¹At the time the regulations were published in 1989, there were only relatively small differences in the wholesale price of formula across the different brands.

Table 5—Share of the WIC infant formula market by manufacturer, 1994-2001

Fiscal year	Ross	Mead Johnson	Wyeth	Carnation
<i>Percent</i>				
1994	54.2	23.0	17.8	5.0
1995	48.5	32.8	13.7	5.1
1996	22.3	62.4	13.2	2.0
1997	31.0	67.4	0	1.4
1998	31.6	65.5	0	2.9
1999	25.8	70.1	0	4.2
2000	26.8	67.6	0	5.6
2001	27.2	67.8	0	5.0

Source: USDA, Food and Nutrition Service.

awarding their contracts to the bidder offering the highest total rebate (Larin, 1996).³² Contracts awarded on the basis of highest total rebate favor manufacturers with high wholesale prices over those with low wholesale prices. P.L. 105-86, enacted in November 1997, requires that contracts be awarded to the bidder offering the lowest net price unless the average retail price for different brands of infant formula do not vary by more than 5 percent.

The two largest infant formula companies, Ross and Mead Johnson, have long dominated the WIC infant formula market. In fact, only two other infant formula manufacturers, Wyeth and Carnation, have ever won WIC sole-source competitive infant formula rebate contracts, and Wyeth stopped producing infant formula under its own name in 1996.³³ Since all WIC State agencies switched to sole-source competitive rebate systems in 1994 (excluding Indian State agencies with 1,000 or fewer WIC participants), Carnation has accounted for between 1 and 6 percent annually of the formula purchased in WIC (table 5). Mead Johnson has gained in market share over Ross in recent years and now accounts for over two-thirds of the WIC market.

³²The States contended that retail prices were not related to wholesale prices, and if retail prices for the different brands of infant formula were similar, then the State would realize the greatest cost savings by awarding the contract to the bidder offering the largest rebate (Larin, 1996).

³³Two small infant formula manufacturers, Loma Linda and Rimaco, participated in several open market contracts in the early 1990s. These companies have since exited the infant formula market.