Two Wheels Turning: Partnership in China’s Soy Sauce Fortification Program

IN NOVEMBER 2003, Chen Junshi was preparing to launch the initial stage of what he hoped would become a nationwide program to combat iron deficiency and iron deficiency anemia in China. As a nutritionist and director of the Food Fortification Office (FFO) at China’s Center for Disease Control and Prevention (CDC), Chen headed a team of CDC experts that had worked since 1997 to develop and implement a program to educate Chinese about the dangers of insufficient iron intake and work to alleviate the problem.

Almost from the start, Chen and his colleagues concluded that any educational outreach they might do to combat iron deficiency would fail unless consumers had not just knowledge of the problem, but the means to increase their iron intake. To this end, CDC experts had sought out and collaborated with some of China’s leading condiment manufacturers, encouraging them to produce and distribute iron-fortified soy sauce.

Among these was Shijiazhuang Zhenji Brew Group Company, Ltd. (Zhenji). Zhenji’s chief executive officer, Zhang Lin, was among the strongest private sector supporters of the CDC iron fortification program. Yet Chen had just arrived at his CDC office in Beijing to find an urgent phone message from Zhang. Chen put down the phone 30 minutes later with a mounting sense of alarm. Zhang had just explained the various reasons why his Zhenji colleagues now objected to participating in the CDC iron fortification program. If Zhang could not persuade his colleagues at Zhenji to participate, Chen knew it would be an uphill struggle to win and sustain the backing of other manufacturers.

Responding to Anemia in China

As in other primarily agrarian developing economies where meat traditionally was consumed only sparingly, iron deficiency and iron deficiency anemia (IDA) was a longstanding problem in China (see Exhibit 1). China’s national census of 2002 estimated that a national average of 20.6% of women of childbearing age suffered from IDA. Among children less than two years old, IDA prevalence was estimated at 24.2%, and at 21.5% among those over 60. Rural women showed higher incidence of IDA than urbanites. China’s 2002 survey concluded that 25.3% of pregnant women in urban areas had IDA, compared to 30.4% of those surveyed in rural areas. Lactating women with IDA comprised 27.3% of city-dwellers surveyed, and 30.4% in the countryside. Adult women remained at risk even in wealthy areas of China, added CDC officers: “In parts of southern Jiangsu Province (just west of Shanghai), IDA prevalence reached 30–40%. China’s experience shows that it is
false to believe that micronutrient deficiencies will disappear as a country gets richer."

China’s Center for Disease Control and Prevention

The CDC originated as a group of scientists tasked with preventing the spread of infectious disease. Nutritional issues were not under its purview, though persisting malnutrition had made the Chinese government attentive to food sufficiency since 1949. This concern had manifested itself since the 1950s in efforts to increase production of grains and other staples. The CDC itself focused on basic research in preventative medicine. As China’s economy took off in the 1980s and 1990s, redressing malnutrition became much less of a state priority. State spending on healthcare declined, support lapsed for the “barefoot doctors” who brought treatment to China’s remote areas, and access to quality medical care – formerly a state-provided service – increasingly involved supplemental payments to doctors and staff.

Into the 1990s, nutrition policy in China fell under the purview of the Ministry of Health (MOH), and nutrition improvement was done by the Nutrition and Food Safety Department of the local CDC offices. However, attention to nutrition policy waned as food safety grew more prominent. A 1998 reorganization of MOH shrunk policy attention on nutrition further. Noting the gap between China’s need for nutrition and the extent of policy devoted to it, CDC officers set up the FFO in 1997. In seeking out ways to improve nutrition in China, FFO officers studied food fortification programs from locations as diverse as the Philippines and the United States.

Meanwhile, a state-mandated reorganization in 2002 gave the CDC responsibility for the prevention as well as control of disease. Already well-respected among the public, the CDC received a boost to its reputation that year by its steady, reassuring performance during the SARS scare that raced through China in late 2002 and early 2003, killing 800 people worldwide.

Developing an Iron Fortification Program for China

Iron deficiency and IDA could be overcome by eating red meat, consuming iron pills or dietary supplements including iron, or by fortifying foods with iron. All of these approaches presented challenges in emerging markets, where few in need could afford a meat-rich diet, and where supplements were expensive and not widely available outside urban centers without government subsidy and distribution. Fortification was not a new approach – China and many other countries had experience adding iodine to salt or fluoride to water – but iron fortification was typically accomplished by fortifying wheat flour.

For China, however, CDC officials asserted that fortified wheat flour was not an ideal solution. The Chinese tended not to consume bread or other goods baked from flour in significant quantity. Wheat flour was not uncommon in northern Chinese cuisine as an ingredient for noodles or as a part of steamed dumplings, but rice remained China’s staple grain, especially in southern China, where growing conditions could support several annual crops. However, the wide geographic dispersion of multiple local grain mills made it difficult to ensure that iron fortification could be both available and consistently administered nationwide, especially in rural areas where IDA was a problem.

Instead, the CDC focused on soy sauce as China’s ideal fortification vehicle, even though other efforts
were also made in China to fortify flour as well. An initial CDC survey of soy sauce production and consumption found that about 80% of the Chinese population consumed soy sauce, at an average daily rate of 12.6 grams per person. Because soy sauce was a condiment rather than a staple food, overconsumption was unlikely. Unlike wheat and rice flour, soy sauce production was relatively centralized. Centralization helped assure quality control. In addition, iron was more easily soluble in soy sauce than in flour.

After tests comparing the effects of fortification with ferrous sulfate and fortification with sodium iron (NaFeEDTA, a highly absorbable combined compound that separates into iron and EDTA in the body), the CDC settled on NaFeEDTA as its fortification agent. NaFeEDTA did not alter the color, taste, or other properties of soy sauce. It also promoted the absorption of iron already present in other elements of the meal and was not affected by several food iron inhibitors. NaFeEDTA was also nontoxic and stable in food vehicles and during food preparation and storage. Most importantly, the body absorbed NaFeEDTA at nearly twice the effective rate as it absorbed ferrous sulfate.

Preliminary studies of children with IDA showed that three months of consuming iron-fortified soy sauce eliminated their anemia. A separate, 18-month, randomized controlled trial of 14,000 people conducted in 2000 in impoverished Guizhou Province showed that consuming iron-fortified soy sauce resulted in a decrease in IDA exceeding 50% in all age groups examined. Incidence of female IDA declined most, by over 70% among 19–30 year-olds. After one year of intervention, children who received iron fortified soy sauce had increased their weight relative to the control group by a statistically significant margin. An academic paper estimated that the increased productivity that would result from an IDA reduction of 30% in the Guizhou township where the study took place would earn the township an extra US$4.25 million over ten years. On the basis of these results, China’s Ministry of Health approved NaFeEDTA as a food fortificant in 1999, and then approved NaFeEDTA for soy sauce fortification in 2002.

Public–Private Collaboration: A New Approach

According to former CDC leader Chen Chunming, China had added iodine to salt since the early 1990s, a task that was made easier to accomplish because salt production was already a government monopoly. Fortified soy sauce was another matter, however. Chen Junshi said the program represented the first time that China’s producers, distributors, and retailers would collaborate in implementing a public health program.

The task was made more daunting by the fact that CDC leaders were not sure how willing consumers would be to adopt the new product. At issue were not the health benefits of iron fortification, but the acceptability of state promotion of a privately produced product. As former CDC leader Chen Chunming recalled, “We began work in 1997, holding discussion, workshops, and then applications. We decided that this fortification program had to be a voluntary, not mandatory, effort. People don’t like forced compliance. Soy sauce is widely consumed, but China is an immature market, so everything that’s popular easily gets faked. For this reason, government must ensure that samples are genuine. Trust is key. Without common trust there’s no basis for cooperation.” On the basis of a CDC report, MOH vice minister Wang Longde agreed that the voluntary approach of this program was appropriate.
But opposition to a collaborative approach was not limited to the possible reaction from the campaign’s target population. Reluctance existed within the CDC as well. As FFO director Chen Junshi put it, “Nutritionists never do things like this.” FFO vice-director Sun Jing elaborated: “Attitudes within the CDC varied. Some argued that, because the CDC system lacked broad administrative authority, it was not the appropriate agent for this project. Others were afraid of being criticized for promoting commercial products, something they saw as not being in the public interest. Others said we at the CDC should just do it ourselves, without working with industry.”

Finding Public Sector Partners

Yet the CDC had almost no power of its own to make things happen. The CDC was an MOH-affiliated technical organization that could be mobilized to fight disease at the local level through its grassroots offices in each province. However, despite the name that they shared, the Beijing-based China CDC had no actual control over the local CDC offices, which reported to the provincial health offices, not to the China CDC in Beijing. This meant that the China CDC relied upon the good offices of local CDC representatives to collaborate and invest in the iron fortification program. Only if the MOH issued documents validating the program would local participation be assured. Similarly, the CDC relied upon local health inspectors to carry out regular inspections of CDC-certified soy sauce manufacturers, though the health inspectors also reported to the department of health at the local level.

Thus, China CDC’s FFO was a small player within China’s public health structure, attempting to initiate a program that would touch multiple government bureaucracies, including the ministries of Health and Commerce, the State Bureau of Industry and Commerce, and the State Commission of Development and Reform, in addition to the State Food and Drug Administration and the General Administration for Quality Supervision, Inspection, and Quarantine (AQSIQ). Making matters more complex was the fact that each of these state entities had its own offices at the national, provincial, municipal, and county levels with which local CDC offices would have to coordinate if the program designed in Beijing was to be successfully implemented.

The local CDC offices were asked to develop and roll out local promotional strategies, sometimes on the basis of ideas originating in Beijing, but typically in response to local opportunities. The local CDC offices were also responsible for developing local education about and awareness of IDA, and for testing blood hemoglobin levels.

Finding Private Sector Partners

Aside from needing to develop good working relationships with public sector actors, the FFO team also needed to define and approach potential partners in the private sector. From the start, the CDC team believed that it was important to partner both with soy sauce makers in China and with the mass media. Without manufacturers, there would be no product. Without the mass media, CDC efforts stood little chance of reaching much of the population outside the specific pilot sites it selected.

The CDC began by seeking out soy sauce makers willing and able to participate in the program. While the CDC was happy to educate the public about IDA and the benefits of iron fortification, it would be up to the soy sauce industry to produce, distribute, and promote their own branded iron-fortified soy sauce. To get the ball rolling, FFO scien-
tist Huo Junsheng approached the China Condiment Association to solicit the industry association’s support and to help guide the CDC’s foray into the business world. As he explained:

*We started out with the condiment association in order to identify good companies to work with. The condiment association gave us early visibility among producers. The industry was old and traditional, so iron fortification was seen as a way to update the industry’s image. Then I went to the provinces to visit companies. Some were very enthusiastic about participating. Two or three firms agreed to participate if the CDC gave them some assistance. One famous firm didn’t want to participate at all. Some were not willing to participate because they felt they were doing just fine and had no reason to go into fortified soy sauce. Their concern was that cooperation with the government would sooner or later lead to pressure to reward the officials who had been of assistance. This is a common problem in China, and many firms raised this as a concern.*

Huo and others worked to educate the soy sauce producers, explaining what the product was, how the technology worked, and what the benefits of offering it were. Said Huo, “We found that senior executives needed to hear arguments not only about the public health benefits of the program but the argument that producing iron-fortified soy sauce would make them money by expanding their market. We told them that we would give them the fortification formula at no cost, train them how to manufacture it, and give them free technical support. In return we made them promise not to sell the fortified product at a mark-up over regular soy sauce.”

**Certification**

All soy sauce makers had to receive China CDC certification before they could participate in the program. China had over 2,000 soy sauce producers, but the China CDC certified only one or two in each of the seven provinces where its pilot efforts were launched (see Exhibit 2 for a map of China). Interested soy sauce makers submitted an application to the CDC’s FFO office, which passed it on to the Chinese Condiment Association for review against nine criteria, though the CDC was willing to work with the firms to raise their standards to meet the certification criteria in cases where there was no other plausible local producer. China CDC experts together with soy sauce technologists would then visit the enterprises that received Condiment Association approval to inspect the production facilities and discuss iron fortification technology in greater depth. On these visits CDC scientists often found additional room for improvement, typically around hygiene issues that constrained product quality. Few soy sauce manufacturers had invested in leading edge fermentation technologies or facilities, and CDC assistance in some instances led to substantive process and quality improvements.

Once a soy sauce maker received CDC approval, China CDC experts would train the firm about the technology, about hygiene standards and hazard analysis, including controls at critical points of production, and analytical methods for NaFeEDTA in soy sauce. Producers were then obligated to put in place and run a HACCP (hazard analysis and critical control point) system for a period of at least three months prior to an official site visit by CDC experts and the licensing of the iron-fortification logo for use by the firm. The HACCP system maintained food safety through hygiene standards, hazard analysis, and control of critical points of the production process. License to
use the logo (see Exhibit 3) came at no cost, but required annual renewal.

Typically, it took three to six months for the China CDC to convince the CDC offices at the provincial level to work with local companies, and another three months to one year to get the companies interested in participating and certified to do so. Most firms needed this time to raise their quality standards high enough to meet CDC certification requirements.

**Shijiazhuang Zhenji Brew Group Co. Ltd.**

Based in Hebei Province (surrounding Beijing), Zhenji was established in 1956 as a state-owned enterprise with assets of 228 million yuan (US$28 million at 2006 rates). Fifty years on, Zhenji employed over 1,200 people and produced 80,000 tons of condiments annually, primarily soy sauce and vinegar. Zhenji had 55% of Hebei's market for soy sauce, and exported 10% of total production, partly under its own brand, partly as a contract manufacturer for others. The company had 16 subsidiaries and was one of the eight largest condiment producers in China.

Zhenji customers fell into three segments: industry (to add soy flavoring to crackers, for example), restaurants, and retailers (for sales to individual consumers). Retailers generated significant profits, but bulk sales to industry were more profitably because they saved on packaging and distribution costs. Unusually for a Chinese state-owned enterprise, Zhenji management had shown a willingness to take hard choices. In 1994, for example, China allowed grain prices to rise to market levels, without any change in the below-market retail price of soy sauce. Because soy sauce was made from fermented grain, Zhenji was forced to manage rising input costs with no ability to alter its prices. Although soy sauce prices eventually were freed over a year later, public expectations remained an informal source of pressure to keep soy sauce prices low.

Many soy sauce manufacturers responded to increased grain prices by reducing product quality. Zhenji's CEO Zhang, however, insisted on maintaining quality, "even if we went bankrupt," according to one manager. "We did a lot of promotion, both through newspaper testimonials and through the condiment association, and we tried to educate the market." Zhenji lost money for a year, the manager said, but "we won the trust of consumers."

Zhenji also proved itself willing to invest in quality. While one way of minimizing the impact of rising grain prices was to diversify out of soy sauce (which Zhenji did by developing its vinegar production capacity at this time), another was to convince consumers to pay a premium price for a premium product. Zhenji pursued this approach both through its marketing efforts and producing soy sauce with the leading available brewing technology.

China's traditional method of making soy sauce combined a loose mash of raw materials with a relatively low concentration of salt in a short fermentation period. By the late 1980s, however, the leading technology was from Japan, and involved fermenting raw materials in liquid state over a longer period of time using a high concentration of salt. The Japanese method required significant investment, however: Zhenji had assets worth only several million yuan to pledge in collateral against the 20 million yuan it would need to purchase and install the required equipment. Debate at Zhenji over the merits of taking the plunge versus sticking with the existing set-up raged on for two years. In addition to taking on significant new debt, upgrading to the
new system would slow Zhenji’s cash flow significantly, constraining internal reserves and limiting the company’s room for maneuver in the face of any unexpected developments. Moreover, no other Chinese company was using the Japanese method. Yet the process yielded the highest quality product, one that would bring higher margins than the soy sauce Zhenji already made. CEO Zhang had set his heart on making Zhenji China’s leading condiment manufacturer, and argued that reaching this goal required Zhenji to make the strategic choice to invest in the new method. In 1989, Zhenji installed the new production technology, increasing its annual capacity over time from 2,000 to 30,000 tons. At the beginning of 2007, Zhenji remained the leading Chinese manufacturer using this technology, which indeed became a major earnings driver for the firm.

Zhenji’s focus on quality manifested itself in other ways as well. During the 1990s, Zhenji was qualified as a kosher product, as meeting the global manufacturing quality standard ISO 9001, as having superior food safety controls, as a “green” food, and as a non-transgenic food. Within China, Zhenji belonged to drafting panels for national soy sauce, vinegar, and blended condiment standards. Because of their quality, Zhenji’s soy sauce and vinegar in 2002 were exempted from inspection by AQSIQ.

Zhenji’s Decision

Given this track record, Zhenji was a leading candidate for CDC certification as Hebei’s producer of iron-fortified soy sauce. Over the years, moreover, Zhenji had collaborated with local health authorities on various issues, and was therefore comfortable with being approached by the CDC. Despite this, and despite Zhang’s track record of successful decision making, Zhenji managers debated for months whether to take part in the CDC program.

Zhenji managers had many worries that made them hesitate over participation in the program. Among other things, Zhenji managers feared that other soy sauce firms would bring out their own fortified products to capitalize on Zhenji’s own promotion of fortified soy sauce. They worried that rural consumers would balk at the price of their product, even if they realized that it was beneficial to do so. The company would have to invest in marketing and distribution to the countryside, and would lose any benefits from doing so if no one bought the product. Managers also worried about the opportunity cost of sales that would be foregone if Zhenji made the investment in an iron-fortified product that fared poorly.

Ultimately, however, Zhenji managers elected to participate in the initiative, for several reasons aside from the benefits to public health. Zhenji managers concluded that fortified soy sauce presented an opportunity to expand its market for soy sauce, especially among anemics diagnosed by CDC clinics and events, and especially in rural areas where the brand had little presence. They also concluded that fortified soy sauce would allow Zhenji to take market share in rural areas from the nonbranded soy sauce of low quality that was typically sold there. As one manager noted, “We all know that consumers are unusually loyal to their brand of soy sauce. We don’t know why, but this loyalty is stronger for soy sauce than for many other products.”

Given what was known about rural purchasing patterns, the supply and promotion of fortified soy sauce would give Zhenji a rare opportunity to penetrate the countryside and develop a new customer base. Rural consumers normally purchased unbranded soy sauce, not in individual bottles from a store, but by bringing their own bottles from home to fill from the barrels of itinerant vendors. The price for a half kilogram might be 0.30 yuan.
Unfortunately, such bulk sales left rural consumers with soy sauce of unknown – but frequently the poorest available – quality, often adulterated. Unbranded, store-bought soy sauce in bottle or bag packaging might cost a farmer triple that amount, or 1 yuan, for the same volume, but was also often of low quality.

More broadly, offering iron-fortified soy sauce was a way to improve the Zhenji brand image among existing consumers. Internally, it was a way to further upgrade product quality. Outside of Hebei, added a manager, iron fortified soy sauce created an opportunity to expand into other urban markets.

Assuming that CDC efforts to raise consumer health awareness worked, Zhenji managers therefore believed that significant market potential existed for the product. They were happy to piggyback onto any public health efforts the government made in order to enhance the company’s own reputation. Managers appreciated that certification would distinguish them from their local competitors. The managers also accepted CDC calculations that increasing iron consumption with iron fortified soy sauce was much cheaper than any other method. For example, at 10 yuan to 20 yuan per year, iron fortified soy sauce was much cheaper than fresh meat, and was but a fraction of the 60 yuan annual cost of medicinal iron tablets, to say nothing of the 600 annual cost of vitamin supplements. Thus, production of iron-fortified soy sauce gave Zhenji an opportunity to diversify its product portfolio into new demographic segments.

Because Zhang had been involved with China CDC’s venture from its beginnings in 1997 – he had participated in the international conference in Beijing that had settled on soy sauce as the fortification vehicle of choice – Zhenji formed a team comprising Zhang, vice-CEO Wang Ergang, marketing vice president Hu Ping, strategist Guo Hongtao to develop and market the fortified product.

“Two Wheels Turning”

To help create a cohesive and easily understandable mission statement from the various organizations that worked with the CDC in some capacity, the CDC adopted a slogan suggested by its marketing consultant, Dong Shengli: “Two Wheels Turning Together (兩個輪子一起轉).” This tagline emphasized the public-private partnership by making the CDCs one wheel and the soy sauce manufacturers the other wheel. The CDC wheel turned toward the objective of alleviating malnutrition, while the manufacturers’ goals increasing earnings. Although their goals differed, neither group could succeed without the other.

Starting in 2002, China CDC launched iron-fortified soy sauce at 20 “sentinel sites” in six provinces – Guangdong, Guangxi, Guizhou, Hebei, Jiangsu, Jilin – and in Beijing. A total of 37 launch meetings were held in these locations to which all the local stakeholders were invited: representatives from commerce, education, industry, media, and the local manufacturers. The CDC hoped to certify at least one soy sauce producer in each province where it launched the program, but qualified producers were not always available.

Within each province, local CDC officials began six months of project training. This included training of health care providers, social marketing within the soy sauce industry, and quality control training courses at the certified suppliers. Once the CDC had its local teams in place, they set about organizing awareness events and developing and disseminating information about iron deficiency, and holding on the street testing for anemia.
Local CDC teams also enlisted the local mass media to assist in the dissemination of articles and information about iron deficiency, IDA, and the iron fortification program. As FFO vice-director Sun Jing pointed out, “We developed articles and other materials, but the real benefit was having the CDC featured on the news. That was coverage we didn’t have to pay for. Luckily, media people were quite sympathetic to our efforts and tried to help spread the word about what we were doing. In some cases, local reporters were tested and surprised to discover that they themselves were anemic, and therefore worked even harder to help spread our message.” The CDC effort made the news not only on local television programming, but even on the national CCTV channel, as well as in local newspapers and radio programs on health topics. Most of the content was prepared by China CDC in Beijing and distributed to the local CDC teams on site. The CDC also set up a website (www.cdc-ffo.cn), and got its message out through web kiosks in Beijing. Within other urban sentinel sites, local CDC teams advertised the campaign with placards on the sides and interiors of busses, as well as in the display cases typically set out along neighborhood streets to display official notices and news announcements. In addition, CDC teams held consultations and made presentations to target audiences by appearing before womens’ groups and at schools, where banners and wall slogans were prominently displayed. CDC teams also distributed posters, leaflets, and brochures in retail establishments that stocked iron-fortified soy sauce (see Exhibit 4). To access rural consumers, local CDC teams painted brick walls along country roads with slogans, and persuaded local villages to show short educational clips at the start of movies that were projected outdoors to the public.

Zhenji’s Results

Zhenji became the only manufacturer in Hebei Province that China CDC certified to produce iron-fortified soy sauce, which it made available in concert with the CDC’s pilot program for Hebei in 2002. Yet the product flopped. Demand for iron-fortified soy sauce almost entirely reflected the degree of promotion the company was devoting to the product.

Ironically, noted Zhenji managers, “We found that when we offered both fortified and regular soy sauce, consumers rejected the fortified soy sauce. Apparently they were skeptical that the product could contain something extra without a price increase, so we went ahead with a price increase for the fortified product to overcome consumer skepticism.” But China CDC officials warned them to keep the price gap between the products low. Said Sun Jing, “High prices lead to the emergence of fake product.”

Project Results

As 2003 drew to a close, results from the pilot programs were rolling in, and the CDC had good news to report. Beginning with the baseline surveys local CDC teams had undertaken in 2002, twelve of the sentinel sites had reported the results of one-year follow-up surveys, and three had reported two-year follow-up surveys.

• Awareness – Awareness of iron deficiency and IDA was up sharply in all seven provinces, from baseline awareness rates of between 2% and 26% (the latter for Beijing), to results ranging between 66% to 80% of the at-risk population after one year, and 90% to 99% at the end of two years.
• **Coverage** – Iron-fortified soy sauce was available at all of the retail outlets within each sentinel site community, and at 60–70% of regional outlets and 30% of provincial supermarkets and convenience stores.

• **IDA Alleviation** – As a result, the anemia rate in women declined from baseline rates of between 17% and 50% (the former for Beijing) to between 15% and 40% after one year, and to 23% in sites reporting results after two years.

After two years of effort, China CDC data showed that 58.6 million residents (of a total population of some 300 million) of the seven provinces and Beijing were using iron-fortified soy sauce, including 34.5 million individuals at risk for iron deficiency. China CDC had certified twenty of a total of 69 applicant companies to produce iron-fortified soy sauce. Even so, noted Huo, “Despite the clear evidence from our studies, some producers still believe that making iron fortified soy sauce is a bad idea.”

**An Unexpected Challenge**

In October 2003, China CDC received a US$3 million grant from the Global Alliance for Improved Nutrition (GAIN) to support health education and social marketing of the iron-fortification campaign over the 2003–08 period. Overhead would be minimal: CDC salaries were paid by the government, and industry matched the funding in kind and with some small contributions.

Although this was thrilling news for the FFO staff in Beijing’s CDC, Chen Junshi had just received sobering news in his phone call to Zhenji’s Zhang Lin. On the basis of its experience with the CDC initiative, Zhenji managers now objected to further participation in the program. The objections fell into three categories: potential market size, the low commercial returns from promotion, and consumer skepticism about the health claims Zhenji made for its products.

To begin with, Zhenji managers worried that they had seriously overestimated the size of their potential new market. Zhenji’s iron fortified soy sauce was available in the consumer marketplace starting in August 2002, but sales were poor in the absence of promotion efforts. Zhenji managers focused their concern on poor rural sales. Said one, “Rural perceptions of healthcare and the importance of nutrition are poorly developed because the farmers are more concerned about getting enough to eat rather than the nutritional quality of their food.” Moreover, Zhenji managers said, iron deficiency was a hidden problem, with no clear or acute symptoms. Most IDA sufferers thought they were just fine. Reported another Zhenji manager, “Even if they consumed a bottle of fortified soy sauce, they might not notice the benefits right away.” Farmers also had low incomes, making them unwilling to pay more to purchase packaged soy sauce, added another. Urban consumers had more ways to consume iron than fortified soy sauce: they could eat meat, take iron tablets, or general supplements including iron, and they tended to have incomes that allowed them to do so.

Zhenji’s results to date also called into question the value of continued marketing efforts. Although experience had shown a direct link between Zhenji’s promotions and consumer purchases, the returns on Zhenji’s marketing expense were too low. Zhenji managers did not know how to sustain sales once promotional campaigns ended. They concluded that nothing justified continuing investment in a program with lower returns than those from other Zhenji products.

Finally, Zhenji managers noted that urban consumers were fed up with exaggerated claims from
vitamin companies about the benefits of their products. As a result, consumers tended to disbelieve all advertised health and nutrition claims that producers made, including Zhenji’s. Iron packaged with herbal extracts was already sold at high prices, but the perceived benefits did not match the claims for the product, or its high price, and Zhenji managers didn’t see how they could do anything to overcome this.

Chen wondered what had gone wrong. There was obviously much left to be done if he was to reach the CDC’s national target of supplying 30% of the national population with iron-fortified soy sauce. Surely there was no lack of passion and effort from the FFO team. Chen saw from a glance at vice-director Sun’s empty chair that she was on the road in support of local campaigns promoting iron-fortified soy sauce. Indeed, over the previous year Sun had traveled so much that she had not been able to spend a single week in the Beijing office without a scheduled trip out of town. Yet Zhenji’s experience demonstrated that the program needed to overcome some important challenges. No vehicle could hope to move forward if it lost one of its wheels.
Exhibit 1. Iron Deficiency and Anemia

The human body needs iron primarily to form hemoglobin, the protein in red blood cells responsible for binding oxygen for transport from the lungs to the body’s tissues, where it is used by the body’s cells to generate energy. Humans obtained iron from their diet, though absorption was limited to about 1mg for every 10mg to 20mg of iron ingested. Growth spurts or pregnancy and lactation boosted iron needs, making women and children particularly susceptible to the effects of iron deficiency. Symptoms of iron-deficiency anemia (IDA) included abnormal paleness or lack of color of the skin, irritability, low energy and fatigue, elevated heart rate, sore or swollen tongue, enlarged spleen, and a desire to eat peculiar substances such as dirt or ice (a condition called pica).

Iron deficiency and IDA were the most common diseases associated with poor nutrition, and each was of particular concern in developing countries. Southeast Asia and Africa were worst affected; a 1992 WHO study estimated the prevalence of anemia among pregnant women in Southeast Asia and Africa at 74% and 52% respectively. A diet low in iron was the leading but not only cause of IDA. Hookworm – which affected an estimated one billion people worldwide – and other sources of internal bleeding caused many additional cases.
Exhibit 2. Location of Iron-fortified Soy Sauce Pilot Programs, by Province, end 2003

Exhibit 3. Iron Fortification Logo

Fe – the chemical symbol for iron
鉄 – the Chinese character for iron
Upper caption: Chinese Center for Disease Control and Prevention
Lower caption: China Condiment Association

Source: CDC, FFO.
Exhibit 4. Sample Artwork from CDC Promotions

Upper caption: “When you have ‘iron’, you have strength”
Lower caption: “When you eat soy sauce, be sure to use the ‘iron’ kind”

Source: CDC, FFO.