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McDonald's Corporation

Whether in Moscow or Massachusetts, the same experience would greet a customer in any of the 12,611 McDonald's quick-service restaurants worldwide. McDonald's had distinguished itself in the quick-service industry through its remarkable consistency across all units. To competitors and customers alike, the Golden Arches—the corporate emblem that adorned every restaurant—symbolized pleasant, fast service and tasty, inexpensive food.

In the United States alone, McDonald's served over 20 million customers every day.[1] Although such a number testified to the restaurant chain's success, it also suggested a troubling question for management. With McDonald's already serving so many customers, how could it possibly attract more business? External pressures reinforced the dilemma. Demographic trends were reshaping American eating habits while competitors were attacking the quick-service giant from all sides. From chains specializing in speed and service, to those offering wider variety and those that featured deeply discounted menus, McDonald's faced competitors poised to challenge the industry leader on all fronts. McDonald's had built its success on a legendary operating system that amazed competitors and the financial community by generating an average annual return on equity of 25.2% from 1965 through 1991, and an average annual earnings growth of 24.1%. However, sales per unit had slowed between 1990 and 1991, causing management to wonder whether the company's operating system, so vital in guaranteeing uniform quality and service at every McDonald's outlet, was suited to the new circumstances the company faced.

Consumers were changing: in addition to an increasing, yet variable, concern for 'healthy' food, there was a growing concern for the environment among consumers. A study of Americans in the summer of 1989 had found that 53% of those questioned had declined to buy a product in the previous year because they were worried about the effects the product or its packaging might have on the environment.[2] Aware of the growing importance of environmental stewardship, McDonald's had recently undertaken a bold collaboration with the Environmental Defense Fund, which seemed to offer some concrete methods by which operations could adapt to the benefit of the environment.

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[1] With 250 million people living in the United States, McDonald's was serving roughly 8% of the U.S. population daily.

[2] Frances Cairncross, "Costing the Earth," pp.190-191. Harvard Business School Press, 1992.

The information presented in this case does not necessarily represent the opinion of McDonald's Corporation. Thanks are due to Terri Capatosto and Shelby Yastrow of McDonald's along with Jackie Prince and Fred Krupp of the EDF. The following provided background material for this case: John F. Love, *McDonald's: Behind the Arches* (New York: Bantam Books, 1986) and Lois Therrien, "McRisky," *Business Week*, October 21, 1991.

Professor David Upton and Doctoral Candidate Joshua Margolis prepared this case as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. Data have been disguised.

Top managers considered three vexing challenges:

- To what extent should McDonald's change its operations strategy to accommodate the growing need for flexibility and variety in products. Was it merely tweaking—or a dramatic change—which would support the company's volume growth objectives?

- To what extent would environmental concerns compromise McDonald's traditional strengths and complicate an already challenging competitive situation?

- Finally, could the lessons learned in the recent collaboration with the EDF help McDonald's as it sought solutions to the continuing competitive challenge?

The Speedee Service System

Dick and Mac McDonald opened their first drive-in restaurant in 1941, relying on carhops—waiters who went from car to car—to take orders from patrons parked in the restaurant's large lot. In 1948, the brothers abandoned their popular format and introduced self-service windows, 15-cent hamburgers, french fries, and milk shakes. They standardized their preparation methods (in what they termed the "Speedee Service System,") with exact product specifications and customized equipment. Every hamburger, for example, was prepared with ketchup, mustard, onions, and two pickles; the ketchup was applied through a pump dispenser that required just one squirt for the required amount. Ray Kroc, who held the national marketing rights to the multimixers used in the restaurants to make milk shakes, met the McDonald brothers in 1954. He was so impressed by their restaurant and its potential that he became a national franchise agent for the brothers, and founded the McDonald's chain. Like the McDonald brothers' first restaurant in San Bernardino, California, the McDonald's chain featured a limited menu, low prices, and fast service. From the moment in 1955 when he opened his first McDonald's, in Des Plaines, Illinois, Kroc made the operating system his passion and his company's anchor. Whereas many competitors could prepare products that were similar to McDonald's, most focused on recruiting franchisees, whom they promptly ignored, and on identifying the lowest-cost suppliers. Kroc, on the other hand, sought (i) to make sure McDonald's products were of consistently high quality, (ii) to establish a unique operating system, and (iii) to build a special set of relationships between the McDonald's corporation, its suppliers, and its franchisees (see **Exhibit 1**).

Getting it Right - Again and Again

McDonald's designed its operating system to ensure consistency and uniformity across all outlets. Operating procedures guaranteed customers the same quality of food and service visit after visit, store after store. Every hamburger, for example, was dressed in exactly the same way: mustard first, then ketchup, onions, and two pickles. One competitor, who operated 250 Kentucky Fried Chicken restaurants, marveled at McDonald's record of consistency:

> I've been to McDonald's in Tokyo, Vienna, and Australia, and I get a great sense of having the same product from each one of their locations. Most people haven't been able to bring the discipline needed in fast food to get that type of consistency.

McDonald's operating system concentrated on four areas: improving the product; developing outstanding supplier relationships; improving equipment; and training and monitoring franchisees. In its quest for improvement, McDonald's revolutionized the entire supply chain, introducing innovations in the way farmers grew potatoes and ranchers raised beef, altering processing methods for both potatoes and meat, and inventing efficient cooking equipment tailored to the restaurant's needs. Most revolutionary, perhaps, was McDonald's attention to detail. Never before had a restaurant cared about its suppliers' product beyond the price, let alone the suppliers' methods of operation.

McDonald's was able to spend as much time and effort as it did in perfecting its operating system because it restricted its menu to ten items. Most restaurants in the 1960s and 70s offered a variety of menu items, which made specialization and uniform standards rare and nearly impossible. Fred Turner, one of Kroc's original managers and later Senior Chairman of McDonald's, stressed the critical importance of menu size in attributing success of the company's operating system:

> It wasn't because we were smarter. The fact that we were selling just ten items, had a facility that was small, and used a limited number of suppliers created an ideal environment for really digging in on everything.

Turner developed the first operations manual in 1957, which, by 1991, reached 750 detailed pages. It described how operators should make milk shakes, grill hamburgers, and fry potatoes. It delineated exact cooking times, proper temperature settings, and precise portions for all food items—even prescribing the quarter ounce of onions to be placed on every hamburger and the 32 slices to be obtained from every pound of cheese. French fries were to be 9/32 of an inch, and to ensure quality and taste, no products were to be held more than ten minutes in the transfer bin.

McDonald's patrolled suppliers and franchisees scrupulously. The meat in McDonald's hamburgers, for example, had particular specifications: 83% lean chuck (shoulder) from grass-fed cattle and 17% choice plates (lower rib cage) from grain-fed cattle. Fillers were unacceptable. Whereas other restaurants merely accepted what suppliers provided and complained only when meat was visually inferior, McDonald's routinely analyzed its meat in laboratories.

In 1991, McDonald's spent $26.9 million on its field service operation to evaluate and assist each of its restaurants. Each of the company's 332 field service consultants visited over 20 restaurants in the US several times every year, reviewing the restaurants' performance on more than 500 items ranging from rest room cleanliness to food quality and customer service. Turner was the first corporate employee to visit and evaluate each restaurant, and, as early as 1957, he summarized his evaluations by assigning a letter grade to a restaurant's performance in three categories: quality, service, and cleanliness (QSC). For more than thirty years, therefore, McDonald's had prided itself on QSC and a fourth letter—V for value.[3]

McDonald's meticulous attention to detail and careful analysis of quality and procedures did not come from an unbending need for regimentation. Instead, McDonald's sought to study every component of its operation to learn what worked and what failed, to determine how best to offer consistently good service and food. Whereas other chains ignored both franchisees and suppliers, McDonald's sought to elicit commitment from them—commitment that required not only adherence but experimentation. Turner explained:

> We were continuously looking for a better way to do things, and then a revised better way to do things, and then a revised, revised better way.

[3] Franchisees could not be graded on value because it violated antitrust regulations, which prohibited rigid pricing and required independent business owners be given the latitude to set prices on their own.

Suppliers

A simple handshake secured every arrangement between McDonald's and a supplier, and it symbolized the way McDonald's revolutionized the entire relationship. Jim Williams, head of Golden State Foods, which supplied McDonald's with meat, contrasted the traditional supplier-restaurant relationship with the changes McDonald's introduced:

> Deals and kickbacks were a way of life. How long you let a guy stretch out his payments was more the determining factor of whether you got the business than the quality of the product you were selling. Kroc brought a supplier loyalty that the restaurant business had never seen. If you adhered to McDonald's specifications, and were basically competitive on price, you could depend on their order.

When McDonald's first approached the established food processing giants, such as Kraft, Heinz, and Swift, the restaurant chain received a cold response. The established suppliers refused to accept McDonald's concepts and specifications and continued to concentrate solely on the retail market. Only small, fledgling suppliers were willing to gamble on McDonald's, and in turn, McDonald's created a whole new set of major institutional vendors. Each McDonald's restaurant ordered 1,800 pounds of hamburger meat per week and 3,000 pounds of potatoes. By meeting McDonald's strict standards and price requests, suppliers were guaranteed future volumes from a burgeoning restaurant chain. Kenneth Smargon, whose Interstate Foods supplied McDonald's with shortening, described the novel relationship that developed:

> Other chains would walk away from you for half a cent. McDonald's was more concerned with getting quality. They didn't chisel on price and were always concerned with suppliers making a fair profit. A lot of people look on a supplier as someone to walk on. But McDonald's always treated me with respect even when they became much bigger and didn't have to. That's the big difference, because if McDonald's said "Jump," an awful lot of people would be asking "How high?"

Suppliers grew alongside McDonald's and were thus carefully attuned to the company's needs. As one supplier commented, "You've got to be deaf, dumb, and ignorant to lose McDonald's business once you have it."

Franchisees

McDonald's referred to its 3,500 U.S. franchisees as its partners for good reason. By 1992, McDonald's generated 39% of its revenues from franchise restaurants. When Ray Kroc first sold franchises, he made sure that his "partners" would make money before the company did, and he insisted that corporate revenue come not from initial franchise fees but from success of the restaurants themselves. That philosophy continued to be at the center of McDonald's franchise and operating practices.

Franchise owners did indeed see themselves as partners, developing such products as the Filet-O-Fish sandwich and the Egg McMuffin in the 1960s and the McDLT in the 1980s. Franchisees also formed powerful regional cooperatives for both advertising and purchasing. Their regional advertising budgets enabled them to "customize" local promotions while also supporting national programs, and the buying cooperatives gave franchisees a channel for challenging suppliers to be innovative, even when those suppliers were meeting corporate requirements.

Together with corporate management and suppliers, franchisees infused McDonald's with an entrepreneurial spirit. All three partners balanced one another, just as the entrepreneurial inventiveness within each balanced their collective emphasis on disciplined standards of quality.

Cooking Up Products

Nothing exemplified the success of McDonald's operating system like the development of its food. From french fries to Chicken McNuggets, McDonald's had distinguished its menu offerings by drawing both on the rigorous operating system, with its focus on uniformity, and on the orchestra formed by corporate management, suppliers, and franchisees.

In Pursuit of the Perfect Fries

When McDonald's first began operating, french fried potatoes accounted for approximately 5% of the entire US potato crop. By 1985, french fries accounted for more than 25% of the U.S. market. McDonald's had made french fries standard fare for an American meal, but more important for McDonald's, french fries became the restaurant chain's most distinctive item. Ray Kroc was well aware of the importance of the chain's fries:

> A competitor could buy the same kind of hamburger we did, and we wouldn't have anything extra to show. But the french fries gave us an identity and exclusiveness because you couldn't buy french fries anywhere to compete with ours. You could tell the results of tender loving care.

McDonald's did indeed apply tender loving care in preparing its french fries. At first the company simply monitored the way french fries were cooked in its restaurants, trying to determine the exact temperature and settings that yielded the best french fries. They discovered, however, that temperature settings on the fryers had little connection to the temperature of the oil in the vat once cold potatoes were dropped in. By putting temperature sensors in the vat and on potato slices, McDonald's charted temperature readings during the cooking process. When a batch of cold, wet potatoes was thrown into a vat of melted shortening, the shortening's temperature dropped radically. Each batch of fries fell to a different temperature, but, McDonald's researchers discovered, the fries were always perfectly cooked when the oil temperature rose three degrees above the low temperature point. This discovery enabled the company to design a fryer that produced perfect french fried potatoes every order.

The initial research team eventually learned that potatoes also need to be cured for three weeks to produce perfect french fries: in that period of time the sugars within potatoes convert into starches. To prevent excessive browning and permit uniform crispness through the fry, McDonald's only accepted potatoes with a 21% starch content. Members of the company's field operations staff visited produce suppliers with hydrometers, a floating instrument that measured the starch content of potatoes when immersed in a bucket of water.

As the number of McDonald's outlets grew to over four hundred in the early 1960s, the company's potato consumption surpassed six million pounds a year. That gave McDonald's and its suppliers sufficient purchasing power to influence growers of Idaho Russet potatoes to adhere to planting practices that yielded potatoes with high starch content. McDonald's also began looking for potato processors willing to invest in storage facilities with sophisticated temperature controls.

In the early 1960s, Jack Simplot, a major potato grower who supplied 20% of McDonald's potatoes, approached McDonald's with an idea for improving the chain's french fries. He agreed to spend $400,000 to put Idaho Russets in cold storage during the summer, when they typically were not

available. During the summer months, McDonald's relied on California white potatoes, less suited to production of crisp french fries. Although his gamble failed, and all of the stored potatoes rotted, Simplot returned with another, bolder suggestion in 1965. He recommended that McDonald's consider converting from fresh to frozen potatoes. Reluctant though the company was to tamper with its renowned french fries, Ray Kroc recognized the distribution problems involved in supplying fresh potatoes to his growing chain. Simplot pitched his idea to Kroc on the basis not of price but of quality, as he later explained:

> They were having a hell of a time maintaining potato quality in their stores. The sugar content of the potatoes was constantly going up and down, and they would get fries with every color of the rainbow. I told him that frozen fries would allow him to better control the quality and consistency of McDonald's potato supply.

McDonald's studied the freezing process carefully, learning that the traditional process robbed structure and flavor from french fries. Ice crystals would form in the potato during freezing, rupturing the starch granules. McDonald's developed a process to dry french fries with air, run them through a quick frying cycle, then freeze them. This reduced the moisture in the frozen fry while preserving its crispness. Simplot volunteered to build the initial production line that implemented this process, and by 1992, his company supplied McDonald's with 1.8 billion pounds of french fries—close to 50% of the chain's domestic potato business. Only a small, local supplier when he first approached McDonald's, Simplot's organization grew to a $650 million frozen potato processing giant.

McDonald's even improved the way restaurant crews filled orders for french fries. Operators had complained that employee productivity suffered because the metal tongs traditionally used to fill french-fry bags proved clumsy. In response, a McDonald's engineer, Ralph Weimer, designed a V-shaped aluminum scoop with a funnel at the end that enabled operators to fill a french-fry bag in one motion and, in addition, align the fries in the same vertical direction within the bag.

Fast Break from Competitors: Breakfast and the McMuffin

In June 1976, McDonald's franchisees introduced the chain's most significant new product: not just a new menu item but a new meal, breakfast. Most operators were sufficiently busy keeping their restaurants open between 11:00 A.M. and midnight, but a Pittsburgh franchisee looked at these hours as a limitation that offered an opportunity:

> We were paying rent, utilities, and insurance twenty-four hours a day, but we were only open for business for half that time. We had all those morning hours before 11:00 A.M. to do some business.

This franchisee began opening his restaurant at 7:00 A.M., serving coffee, doughnuts, sweet rolls, pancakes, and sausage. Without detracting from McDonald's existing menu, he generated entirely new business.

Other franchisees would agree to extend morning hours only if they happened upon a breakfast item that promised enormous sales growth. Herb Peterson, a franchise operator in Santa Barbara, California believed that to launch a new meal, McDonald's required a unique product that could be eaten like all other McDonald's foods—with the fingers. He turned to a classic egg dish—Eggs Benedict—for inspiration.

In 1971, he developed a sandwich and a special utensil that could, in classic McDonald's style, guarantee foolproof production of the sandwich. A cluster of six Teflon-coated rings could be used on a grill to give eggs the rounded shape of an English muffin while giving them the look and

taste of poached eggs. When a slice of cheese and bacon were added, McDonald's had developed the cornerstone product of its breakfast menu: the Egg McMuffin.

McDonald's rolled out a complete breakfast menu in 1976, featuring the Egg McMuffin, hotcakes, scrambled eggs, sausage and Canadian style bacon. McDonald's had again distinguished itself from competitors, none of whom responded until the mid-1980s, by which time McDonald's held a virtual monopoly on breakfast, which accounted for 15% of average restaurant sales.

McDonald's once again turned to suppliers for support in developing the Egg McMuffin; some were responsive while others lost a revolutionary opportunity. Pork processors, for example, worked with McDonald's to build equipment that could cut round slices of bacon instead of strips.

Chicken Comes to the Golden Arches

In the late 1970s, McDonald's official chef, Rene Arend, tried to develop an onion product—deep-fried chunks of onion—but the variation in onion supplies made it difficult to control quality. Instead, CEO Fred Turner suggested that Arend substitute bite-sized chunks of deep-fried chicken.

McDonald's immediately turned to two suppliers to help develop the product in record time. Gorton, the original supplier of fish for McDonald's Filet-O-Fish sandwich, was selected to solve the breading and battering challenge as it had done previously with fish. McDonald's handed the most difficult challenge to Keystone, one of McDonald's meat suppliers: find an efficient way to cut chicken into bite-sized, boneless chunks. Arend, meanwhile, developed four sauces to accompany the nuggets. The collaborative effort between McDonald's and its suppliers produced breakthroughs that made the new product, Chicken McNuggets, not only possible but unique: a modified hamburger-patty machine that cut boneless chicken into nuggets, for example, and a special batter that gave the nuggets the taste and appearance of being freshly-battered.

By March 1980, just five months after beginning work on McNuggets, McDonald's was testing them in a Knoxville restaurant. Within three years of introducing Chicken McNuggets throughout its chain, McDonald's was deriving 7.5% of domestic sales from its newest product. The giant of the hamburger business had suddenly become the second-largest chicken retailer in the food-service industry, positioned behind Kentucky Fried Chicken. Keystone's efforts on behalf of McDonald's again provided proof of the success bred by loyalty: by 1992, Keystone had 65% of McDonald's chicken business, transforming the meat supplier into a major chicken producer as well.

Competitors and Growth

McDonald's had built the most successful quick-service franchise in the world, maintaining phenomenal growth for over 35 years. Distinguishing itself from other chains by adhering tenaciously to an operating system focused on uniformity, it worked with its franchisees and suppliers as partners to improve the operating system and introduce new products. But as management reviewed McDonald's performance in recent years, many wondered if the company's traditional strategy still suited the dramatic changes it now seemed to face.

McDonald's share of the U.S. quick-service market had dropped from 18.7% in 1985 to 16.6% in 1991, even though the company gained sales from a bigger quick-service "pie." Despite this, between 1988 and 1990, sales per U.S. outlet dropped an average of 3.7% in real dollars. After years of double-digit income growth, McDonald's 1991 net U.S. income grew just 7.2% to $860 million. It was estimated that by 1995, profit from overseas outlets would surpass profit from U.S. outlets. Overseas business, in fact, showed the greatest growth in recent years, with operating income rising from $290 million in 1987 to $678 million in 1991. Although international expansion clearly offered McDonald's its most fertile frontier, McDonald's had to concentrate on U.S. operations. There were 2,500

franchisees in the United States, over 8,814 restaurants (1,416 company-operated), and 25% of company revenues came from franchise fees based on a percentage of sales. U.S. business accounted for 60% of profits, and it simply had to be bolstered.

Moreover, McDonald's had to consider demographic trends. Hamburger consumption had dropped from 19% of all restaurant orders in 1982 to 17% of all orders in 1990 (Hamburger consumption at *McDonald*'s had nevertheless increased over the same time period.) Increasingly, though, consumers were becoming more conscious of nutrition and dietary *options* without compromising taste. The change in dietary preference was, however, certainly not universal, and there was a strong constituency of customers who continued to enjoy McDonald's traditional fare.

The quick-service industry had grown at an average annual rate of 8.7% in the 1980s but was projected only to keep pace with inflation during the 1990s. Perhaps most confusing in its implications, the number of meals eaten off the premises of quick-service restaurants had increased from 23% in 1982 to 62% in 1990. McDonald's responded with double drive-thru windows to keep pace with changing consumer preference, as well as new venues for its restaurants, such as schools, sporting arenas, museums, airports and hospitals. It also developed new smaller restaurants, less expensive than its traditional designs, which could service customers profitably in "seam" areas between existing McDonald's restaurants.

New Competition

The once-simple quick-service market had been complicated by the entry of specialist competitors who had emulated McDonald's strategy to capture their own segment of the market. Michael Quinlan, Chairman of McDonald's, acknowledged just how fierce the competition had become. "Our competition is much tougher, no question about it. And not just in numbers but in quality." McDonald's most menacing competition no longer came from Burger King, Wendy's, or Kentucky Fried Chicken—the traditional rivals.

Chili's and Olive Garden catered to customers searching for full-service and greater variety. Both were family-style restaurants where patrons sat down to be served. Menus offered a wide variety of foods, yet prices remained competitive with those at McDonald's. (See **Exhibit 2** for McDonald's menu.) Casual dining restaurants were likely to grow in the 1990s as their most frequent patrons—people between the ages of 40 and 60—increased in number by about 20 million.

Two hamburger chains, Sonic and Rally's, offered drive-through service only and specialized in delivering burgers fast. For four years Sonic sales per restaurant grew an average of 11.3% per annum, and in 1991 alone, sales per unit increased 13%. There were 1,150 Sonic units and 327 Rally's.[4] Taco Bell featured Mexican food and a menu with 26 items under one dollar. Along with Kentucky Fried Chicken and Pizza Hut, Taco Bell was owned by PepsiCo and had seen the greatest increase in sales of any quick-service chain in the late 1980s. By learning from McDonald's, Taco Bell shifted food preparation to outside suppliers, reduced kitchen space in its outlets, and used a cost-based strategy to compete—prices were always kept low. Between 1988 and 1991, Taco Bell served 60% more customers and sales rocketed 63%.

Early Responses from McDonald's

McDonald's drew on its traditional strengths to respond to competitors' challenges and customers' new habits. Careful product development, closely gauged to customer tastes, again formed the focus of attention as McDonald's turned to suppliers and franchisees for assistance. To address concerns about nutrition, McDonald's had introduced salads, chicken, and muffins. In

[4] Therrien, "The Upstarts Teaching McDonald's A Thing or Two," *Business Week*, October 21, 1991, p. 122.

conjunction with Keystone and Auburn University, it developed the first-ever 91% fat-free burger, McLean Deluxe. Keystone also convinced McDonald's to experiment with chicken fajitas, which proved an instant success in initial tests. The chicken arrived precooked and seasoned, so it only required heating and did not slow operations. The fajitas sold well in market tests and were soon scheduled for national introduction.

Just as McDonald's had spent five years perfecting its breakfast menu for national roll-out, the company spent seven years developing a pizza suitable for its restaurants. Meticulous product development included design of advanced technology, as it had when McDonald's engineers introduced a special french-fry scoop and a grill that prepared hamburgers in half the time by cooking them on both sides simultaneously. Now McDonald's engineers had invented a pizza oven that could cook McDonald's Pizza in under five minutes. In addition, McDonald's was developing new staging equipment—high-tech temperature and moisture controlled cabinets—that would allow parts of a product to be prepared ahead of time without detracting from food quality. Toasted buns, for example, could be stored in these containers without becoming dried out.

In early 1991, McDonald's returned to a value menu, cutting prices an average 20%. Cheeseburgers sold for only 69 cents and McDonald's Happy Meals™—complete children's meals (sandwich, fries, drink, and toy in a olorful box)—for just $1.99. As a result, sales of hamburgers increased by 30% and customer counts rose. Revenues and profits, however, increased less dramatically.

These initial moves suggested a fundamental tension between McDonald's expanded efforts to provide greater value, on the one hand, and enhanced variety, on the other. As Fred Turner noted, "We're a penny-profit business," and with a value menu, volume was critical. That made the chain's hallmark of speed more vital than ever, yet a wider variety of menu offerings posed the risk of slowing each unit's service. Variety and value had to be carefully balanced. Management's challenge was to sustain McDonald's painstaking attention to products and service in achieving that balance.

Flexibility and Growth

McDonald's had achieved success by focusing on a simple formula: limited menu, low prices, and fast service. The Golden Arches symbolized a uniform product—primarily burgers, fries, and shakes—delivered in a consistent manner. Whereas uniformity and consistency had formed McDonald's focal point for thirty-five years, the company's new advertising slogan seemed to suggest a subtle yet significant shift: "*What You Want Is What You Get at McDonald's Today.*" Catering to customers had always been the company's focal point, but to meet changing and divergent customer needs, McDonald's was exploring many different options, and management thought a basic question had to be answered. Would the chain's new concern with flexibility in meeting customers' changing needs require a fundamental change in McDonald's bedrock strategy? Or was this just a new, albeit incredibly complicated, situation once again adaptable to the company's traditional approach?

Early responses to new customer desires and intensifying competition represented just a piece of the company's maelstrom of creative activity. Further efforts were in progress as well. For example, McDonald's had developed a number of new building prototypes, from drive-through-only models to compete with Rally's and Sonic, to small cafes suitable for small towns. Menu diversification offered the greatest area of experimentation. A wide range of items were being tested, including lasagna, carrot sticks, corn on the cob, fruit cups, and oven-baked chicken. McDonald's was also looking for new ways to address nutritional concerns revolving around calcium deficiency and sodium and fat reduction.

McDonald's changes to date had not threatened its traditional operating system, but increased variation throughout the chain—whether in menu offerings, building plans, or eating experience—would pose formidable challenges to McDonald's in maintaining its remarkable quality control and speed of service. The operating system had been constructed to ensure uniformity, quality, and speed at all McDonald's restaurants. If the chain intended to offer a wider variety of foods, such as spaghetti and meatballs or baked chicken, it could disrupt an operating system built around a limited menu.

McDonald's traditional rival, Burger King, afforded an example of the dangers contained in variety. Burger King flame-broiled its hamburgers, which some perceived would be tastier than McDonald's grilled burgers—*if* the flame-broiled Burger King burgers were cooked correctly. But flame-broiled hamburgers were inconsistent in quality and Burger King was not able to implement an operating system that could sustain consistency across all units.

Increasing variety posed another potential dilemma for McDonald's. As the chain responded to pricing challenges from competitors like Taco Bell, higher volume became imperative. To generate higher volume at each restaurant, speed became even more important, and speed could not be risked on a cornucopia of new products. Although the new menu items McDonald's had thus far tested, such as chicken fajitas, had not clogged operations and were well-received by franchisees, McDonald's had to guarantee similar smoothness with some of the more exotic products under consideration, whether chicken, spaghetti, or corn on the cob.

The sheer number of additional products could also detract from the speed of service. McDonald's perfected its operating procedures and equipment in part to accommodate its work-force, whose annual turnover rate was greater than 100% (this was, nevertheless, the lowest in the industry). While McDonald's commitment to training continued to set the industry standard, no McDonald's outlet could afford to engage in complicated preparation processes for new products that might work at cross-purposes with speed of service.

If those challenges did not prove sufficiently daunting to the quick-service giant, it also had to consider restaurant image if it hoped to expand its business through enhanced variety. McDonald's had built its image as the place for hamburgers and quick-service—not for other food and not for casual dining. If people sought Mexican food, they would go to Taco Bell. If people wanted pizza, they would go to Pizza Hut. If they wanted to sit down to a leisurely, reasonably priced meal, Olive Garden, Chili's, Perkin's, TGI Friday's, and Friendly's all came to mind before McDonald's. Not only did McDonald's have to extend its own image, it also had to confront the established reputations of competitors.

These challenges appeared especially troubling because dinner presented perhaps the final frontier of potential growth. Only 20% of McDonald's sales came from dinner, and to entice customers to visit the Golden Arches for dinner required a new menu—as it had for breakfast—and even a different ambiance. To defend against competitors, McDonald's could not introduce dinner items one by one. Competitors could tout their specialties and thus respond easily. McDonald's, therefore, had to present an entire dinner menu at once, and the earliest possible date for such a rollout appeared to be the spring of 1993.

Dinner differed in other ways too. Lunch and breakfast customers were most concerned with speed and convenience, but dinner was more of an event, and customers expected full meals and more complete service. Table cloths and table service, for example, did not seem out of the question. With 62% of 1990 quick-service sales coming from off-premises eating, compared to just 23% in 1982, the trends for lunch and breakfast seemed to be headed in the opposite direction.

While these competitive pressures mounted, a new challenge had been growing: protecting the environment. While many companies had seen the outbreak of environmentalism in the late 1980s

as a threat—McDonald's saw an opportunity: the chance of knitting a responsible environmental policy into its evolving operations strategy.

Management considered all of these challenges and knew McDonald's would like to maintain the same core menu, operating systems, and decor. The chain would nonetheless have to allow greater latitude across units and provide a broader variety of products and experiences for the customer. But would there still be such a thing as a standard McDonald's?

Stepping into the Future: McDonald's and the Environment

> "We're not wild-eyed zealots who are going to give away the store, but we'll always ask, 'Are we doing the right thing?' And remember, we live where we work, and we care about where we live."—Keith Magnuson, Director of Operations Development.

One recent development proved that there still could be a standard McDonald's, despite the most basic changes in operating procedures. On October 10, 1989, Ed Rensi, president of McDonald's USA., met with Fred Krupp, the Environmental Defense Fund's executive director, at EDF's request. EDF recognized McDonald's substantial existing initiatives in recycling, and its critical role as an industry leader. McDonald's recognized EDF's expertise in solid waste management and the importance of seeking expert opinions.

When McDonald's accepted EDF's suggestion to help assess the company's solid waste stream and explore ways to reduce it, McDonald's was making a bold move. It was engaging a new partner to help address environmental concerns, one aspect of the increasingly complex situation in which the company now found itself. For a private corporation of McDonald's stature to collaborate with an environmental organization entailed significant risk and required a willingness, by both parties, to consider new ways of thinking about operating practices. The partnership, however, turned out to be a noteworthy success, generating advances in areas beyond waste reduction. "We went about finding environmental solutions," commented Bob Langert, "and we discovered efficiencies we never saw before."

The Newest Partner: Environmental Defense Fund

The Environmental Defense Fund (EDF) was founded in 1967 on Long Island, New York, to stop the spraying of DDT, a pesticide which threatened birds by causing their eggshells to thin. By 1990 EDF had become one of the nation's most respected and effective public-interest organizations working to protect the environment. It had over 200,000 members and recorded more than $18.5 million in 1991 revenues. Although most widely known initially for its legal work, especially its suits against private companies and the government, EDF now had twice as many economists and scientists as attorneys on staff. In the 1970s and 1980s EDF produced studies linking sulfur emissions to acid rain, lobbied successfully for legislation reducing the lead additives in gasoline, and designed several water conservation projects. EDF had helped fashion the Clean Air Act of 1990, taking a controversial stand by working with the government to create policy and by recommending market-based incentives to reduce pollution. The organization's sound economic and scientific studies and its practical approach garnered respect from all sides of environmental issues. However, actually collaborating with a private company—especially McDonald's, often referred to as the symbol of today's disposable society by many organizations in the environmental community—entailed tremendous risk and EDF, after all, would take no money from McDonald's. Jackie Prince of the EDF outlined EDF's views:

Despite all the risks, we felt it was worth it—we **have** to explore a variety of different strategic alternatives and look for approaches which will find solutions and produce results for the environment.

Waste Reduction Task Force

In August 1990, four senior managers from McDonald's joined two staff scientists and an economist from the Environmental Defense Fund to form the Waste Reduction Task Force. In April 1991, the task force released its comprehensive report, which not only covered every aspect of McDonald's solid waste stream but also offered testimony to a successful relationship.

Bob Langert was one of the members of the task force and acknowledged the stereotypic suspicions both sides had at first. Quickly, however, McDonald's and EDF came together and began thoroughly examining solid waste at McDonald's. "We didn't decide to get married on first sight," recalled Langert. "At some point we came together. It was a mating game." To build rapport and gain a true understanding of McDonald's business, EDF participants were given access to all corporate information and even worked in a McDonald's for a day. For its part, McDonald's felt that a separate department dedicated to environmental issues would only belittle the company's efforts, so all environmental initiatives were to be directed through operations development.

The task force designed an action plan that met three criteria. First, the plan was comprehensive, covering all materials and all aspects of McDonald's operations. Second, it offered incremental solutions. "There is no single answer, no grand-slam home run," Langert mused. "While we were looking for this grand solution, though, we grasped the scope of the problem." The task force therefore identified an array of solutions, each complementing the other. Third, the plan made environmental action an ongoing activity at McDonald's: the report outlined areas where McDonald's developed new environmental criteria to be considered on a par with other business considerations. The joint task force delineated 42 distinct initiatives revolving around the environmental hierarchy of reduction first, reuse second, and recycling third. A set of management mechanisms accompanied each initiative to incorporate it into McDonald's standard operating procedures and ensure accountability.

The 42-step waste reduction plan included initiatives such as the introduction of reusable shipping containers and other materials, substantial packaging changes, use of unbleached paper products, new and expanded recycling efforts, composting trials, and employee retraining. Together, these initiatives would cut the waste stream at the chain's 8,500 U.S. restaurants by more than 80 percent.

Through careful study, the task force calculated that each McDonald's generated an average of 238 pounds of on-premise solid waste per day, or .12 pounds per customer. That did not even include the solid-waste generated by take-out customers, who represented 40% to 60% of store business. (See **Exhibit 3** for characterization of McDonald's solid waste). Although McDonald's was perceived by some as an environmental demon because its products were all served in disposable containers, the task force determined that 80% of the chain's solid waste was in fact produced behind the counter. Its challenge, as a result, loomed even larger than expected: McDonald's could not simply tinker with the packaging of its products. Whatever course McDonald's pursued, its efforts to reduce solid waste could not disrupt any unit's service, had to involve numerous suppliers, and required sufficient flexibility to accommodate franchisees operating in different regions.

McDonald's sought to set ambitious goals for its franchisees while permitting sufficient latitude for each unit to achieve those goals. "We can allow for local autonomy," commented Langert, "as long as we're being as aggressive as possible." It would be left to each franchisee to determine the most viable means for achieving goals. In densely populated states, such as Massachusetts, California, and New York, franchisees might address solid waste issues by relying heavily on recycling.

McDonald's units in Texas, on the other hand, might find lower landfill fees and less reason to explore recycling as vigorously, and instead focus primarily on composting.[5] Here too Langert offered a realistic outlook.

> Some percentage of the 42 initiatives will fail. We might not get it right the first time, but we'll test again. Composting may be difficult at first, so we'll learn to develop new packaging that can in fact be composted better.

The task force evaluated possible actions according to their effect on four parties, each considered of equal importance: customers, suppliers, franchisees, and the environment. Shipping pallets provided an example of a transparent change McDonald's made (with minimal impact on operations) and was now encouraging suppliers to make. Standard pallets had been used an average of 1.8 times, creating an expense on two ends: constant replacement and landfill fees. McDonald's adopted a durable pallet that could be used between 30 and 40 times, reducing waste, decreasing costs, and having no effect on operations.

Although the task force sought foremost to reduce the materials McDonald's used and the solid waste generated, it stressed the importance of examining the full lifecycle of all materials. The task force identified ways to reduce environmental impacts arising during initial stages—raw materials acquisition, manufacturing, and distribution—as well as during actual use and handling after use, whether discarded, reused, or recycled. To make sure that recommended actions had a net positive effect on the environment, the task force scrutinized each solid waste reduction option from the perspective of lifecycle assessment (see **Exhibit 4**).

Brown Bags

The changes inspired by environmental analysis came after deliberation over all the alternatives, deliberation that demanded more than scientific calculation. For example, one supplier presented McDonald's with a bag that was 17% lighter and thus used less material and generated less waste. Another supplier, however, offered a bag containing 65% recycled newsprint, which subsequently led to a bag constructed from 100% unbleached, recycled material—50% post-consumer waste and 50% post-industrial waste. After careful evaluation, the task force recommended the 100% recycled bag, which contained the least amount of virgin material. Because the new bags used unbleached material, they were brown instead of white. Initial customer reaction was tepid, yet the task force discovered in restaurant testing that once consumers understood why the bag looked different, they felt good about it. McDonald's did in fact adopt the 100% recycled bag, suddenly recognizable in its advertising campaign and thoroughly explained in brochures available at each restaurant.[6]

Corrugated Boxes

Corrugated boxes made up one of the two largest components of McDonald's on-premise waste, accounting for 34% of solid waste by weight. Every McDonald's restaurant went through 300 to 400 corrugated boxes per week. As it had done so often in other areas of its operations, McDonald's again turned to suppliers. Boxes contained an average 21% recycled content, but McDonald's commissioned an outside consultant to survey the paperboard industry's capacity to increase that level. Suppliers worried that additional recycled content would weaken the boxes and make them

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[5] Composting is a natural biological process. In open-air piles or vessels, microbes break down organic materials into a soil or humus. Organic materials include items such as coffee grinds, egg-shells, food scraps, and soiled paper packing.

[6] McDonald's Corporation/Environmental Defense Fund Waste Reduction Task Force, *Final Report*, April 1991, p. 94.

more expensive and heavier. One small supplier, though, approached McDonald's with a new box containing 21% old newsprint. With the consultant's findings and a sample box in hand, McDonald's fixed an ambitious objective of 35% recycled content for its corrugated boxes. In September 1990, McDonald's mandated a 35% level for all suppliers and established a system to monitor and track adherence to this goal. Environmental criteria were now as important as all other criteria in McDonald's review of supplier performance.

By making such challenging demands, McDonald's did more than extend its dedication to quality into the environmental realm. McDonald's created a market for the recycled materials its stores would be generating. And the few McDonald's outlets that had already begun recycling corrugated boxes already realized reductions of $250 to $600 per month on garbage collection.

McRecycle USA

Prior to McDonald's collaboration with EDF, McDonald's had announced its McRecycle USA. program. This program called for McDonald's to spend $100 million annually on using recycled products when constructing, renovating, and equipping McDonald's outlets in the United States. Almost 350 new McDonald's were built every year in the United States, and close to 1,000 were remodeled. Just as McDonald's was doing in mandating 35% recycled content in corrugated boxes, the company was strengthening a market for recycled materials. Over 500 suppliers and manufacturers had already registered to participate in McRecycle USA.

Sandwich Packaging

McDonald's generated tremendous controversy when it decided to abandon the polystyrene clamshell it had been using to package its sandwiches since 1975. But the decision represented the most careful analysis the task force completed on any one issue and perhaps the most environmentally conscientious move McDonald's had ever made. By shifting to quilted wraps, McDonald's reduced the volume of waste from sandwich packaging by 90% and the volume of shipping packaging by over 80%.

McDonald's selected its packaging on the basis of three criteria: availability, functionality, and cost. To be suitably functional, sandwich packaging had to perform highly in four areas. First, it had to provide proper insulation to keep the food warm for a specified time in the holding bin. Second, the packaging had to keep the food tasty and moist without allowing it become either soggy or dry. This was called "breathability." Third, food-packaging was evaluated for its handling ability. Did the packaging sustain product integrity—did it, for example, allow employees and customers to handle the sandwich in a sanitary manner? Fourth, packaging had to meet standards of appearance. It had to permit printing and graphics that would enable crews and customers to recognize the sandwiches quickly.

To evaluate the quality of sandwich packaging, McDonald's conducted a battery of tests. The company measured internal food temperatures as well as temperatures at different time intervals. The company used blind taste-tests and moisture analysis. McDonald's also judged grease resistance, product appearance, locking mechanisms, and folding characteristics. Every form of food packaging came with a set of procedures for wrapping the food and with training materials that connected preparation of the menu item with the appropriate method of packaging.

To these rigid standards the Waste Reduction Task Force added a new set of specifications. Every form of packaging would be evaluated according to the reduction it represented in materials and in production impacts (such as energy use and emissions). Packaging was also judged for its use of reusable material and recyclable material, as well as for its recycled content and use of materials that could be composted.

To improve performance of its packaging, McDonald's had, in 1975, switched from paperboard sandwich packages to polystyrene (foam) clamshells. Contrary to the confusion surrounding McDonald's switch from polystyrene packaging in November 1990, McDonald's did not return to paperboard packages. It introduced a thinner, paper-based wrap, once again making a switch based on performance criteria, which now included environmental standards.

The new sandwich packaging consisted of a three-layered wrap: an inside layer of tissue, a sheet of polyethylene in the middle, and an outer sheet of paper. Unlike paperboard containers, the layered wrap performed as well as the foam clamshells on the traditional packaging criteria and met higher environmental standards: it promised a large reduction in solid waste.

Just prior to the switch, McDonald's had announced an ambitious program to test plastic recycling in conjunction with plastic manufacturers. The switch from clamshells, therefore, elicited sharp reactions in the media. Immediate response accused McDonald's of pandering to public misconceptions about the environment. McDonald's was accused of exploiting the clamshell's notoriety as an icon of the throwaway society, eschewing the less popular and more difficult solution. "Had we only been out to score with the public," Langert retorted, "we would have returned to paperboard, which is actually worse for the environment but is perceived by the public as preferable to plastic." The analysis of alternative packaging did include an assessment of existing and potential recycling of foam clamshells. (See **Exhibit 5** for comparison of sandwich packaging.)

Nonetheless, McDonald's had serious qualms about the switch. Moving away from foam clamshells affected five suppliers, and two in particular felt a significant impact. The company hated to abandon a supplier and wondered how the move might affect its relationships with other suppliers. McDonald's considered those relationships sacrosanct, but relationships with suppliers all revolved around providing the best available product. In fact, it was an existing supplier that approached McDonald's with the layered wrap in the spring of 1990 after two years of preliminary testing.

From the spring of 1990 until the wrap's introduction in November, both the supplier and McDonald's tested and developed the packaging further. When it met standards for heat retention, appearance, moisture control, and waste reduction, the wrap was tested in several McDonald's restaurants on the Quarter Pounder with Cheese.

Meanwhile, McDonald's asked EDF to compare the environmental merits of the new packaging to foam clamshells. The layered wrap promised three areas of reduced waste when contrasted with the clamshell. First, the volume of the boxes in which the layered wrap was shipped paled in comparison to clamshells. Second, production of the wrap entailed less industrial pollution than that associated with the manufacture and handling of polystyrene. Third, the layered wrap was itself of lower volume, so it promised to reduce the impact of waste disposal.

Plans to recycle polystyrene could hope to capture only the foam from products eaten on the premises of a McDonald's, so even if each restaurant could recover every clamshell used on site, that would constitute just a 40% to 50% reduction in disposed waste. In contrast, the layered wraps themselves represented a 90% reduction in volume over clamshells. When compared on energy use, air emissions, waterborne wastes, and solid waste generation, the layered sandwich wrap appeared far preferable to polystyrene foam: the wrap required 85% less energy, generated 40% less air emission, produced 80% less discharge into water and 60% less solid waste. (See **Exhibit 6** for overall environmental comparison of packaging alternatives.) Despite the clear choice implied by both performance tests and environmental studies, the task-force report carefully described McDonald's switch to layered wraps:

> It is critical to note that McDonald's decision to phase out polystyrene packaging and substitute paper-based wraps cannot be evaluated as a generic "paper vs. plastic" issue. . . Not all plastics or paper materials are created equal. Therefore,

the specific nature of the materials involved—their mode of production, their current rate of recycling, and so on—dramatically affects their relative environmental consequences and must be carefully taken into account in any comparison.

Planning for the Future

As McDonald's managers reviewed the work of the task force, they wondered what lessons they might draw from the experience with the task force. Had it all been worth it?—or was this just a distraction from the competitive pressures challenging McDonald's as it strived to maintain its growth targets? Was this just a transient issue, like the energy crisis of the seventies, or should it become a primary goal of McDonald's future operations? Throughout the effort, one member of McDonald's top management recalled, McDonald's never forgot its business. "We're in the business of making hamburgers—of serving quality food at a low price. We're not in the packaging business." That business was growing more complex even without the environmental initiative. McDonald's was faced with unprecedented challenges for variety and flexibility in its service. The choices were clear. First, the company could rely on its traditional recipe based on consistency and quality through standardization, one which had made it the paragon of success in the quick-service business. Alternatively, McDonald's could make some changes in its basic strategy—by allowing even more franchisee autonomy and continuing to provide a growing variety of offerings and service in its restaurants. But how far was too far?

On October 1st, 1992, Burger King announced a dinner menu, and that it would begin table service between 5 p.m. and 8 p.m. in its company-owned restaurants.

Exhibit 1 McDonald's Original Menu

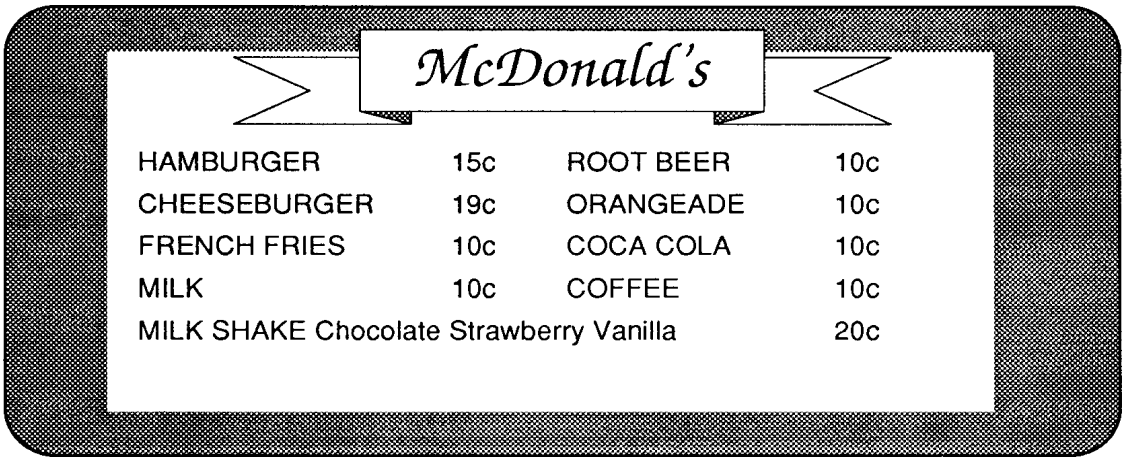


Exhibit 2 McDonald's Menu: 1992

APPROVED NATIONAL MENU ITEMS - Listed on Menu Board -(Effective 6/1/92)

Regular Menu Items

1. Hamburger
2. Cheeseburger
3. Quarter Pounder with Cheese
4. Big Mac
5. McLean Deluxe (and cheese option) (8, 12, 16 oz.)
6. McChicken Sandwich
7. McNuggets - 6 Piece
8. McNuggets - 9 Piece
9. McNuggets - 20 Piece
10. Happy Meal - Hamburger
11. Happy Meal - Cheeseburger
12. Happy Meal - 4 pc. McNuggets
13. Filet
14. Chunky Chicken Salad
15. Chef Salad
16. Garden Salad
17. Side Salad
18. Small Fries
19. Medium Fries
20. Large Fries
21. Lowfat Milk Shakes
22. 1% Milk
23. Drink - Child Size (12 oz.)
24. Drink - Small (16 oz.)
25. Drink - Medium (21.9 oz.)
26. Drink - Large (32 oz.)
27. Orange Juice
28. Coffee (8, 12, 16 oz.)
29. Decaffeinated Coffee Fresh Brewed
30. Hot Tea
31. Iced Tea (12, 16, 21.9, 32 oz.)
32. Apple Pie
33. Chocolate Chip Cookie
34. McDonaldland Cookies
35. Sundaes
36. Cones

Breakfast Menu Items

1. Egg McMuffin
2. Sausage McMuffin w/Egg
3. Big Breakfast
4. Hotcakes and Sausage
5. Sausage Biscuit
6. Sausage/Egg Biscuit
7. Bacon/Egg/Cheese Biscuit
8. Breakfast Burrito
9. Hash Browns
10. Apple Bran Muffin (fat free)
11. Cereal (Wheaties & Cheerios)

APPROVED NATIONAL "VALUE MENU COMBOS" - Listed on Menu Board - (Effective 6/1/92)

Regular Menu	Breakfast
1. Big Mac, Lg. Fry, Med. Drink	1. Egg McMuffin, any size drink
2. 2 Cheeseburgers, Lg. Fry, Med. Drink	2. Bacon Egg & Cheese Biscuit, any size drink
3. Quarter Pounder w/Cheese, Lg. Fry, Med. Drink	3. Sausage McMuffin w/Egg, any size drink
[a]4. McChicken, Lg. Fry, Medium Drink	*4. Sausage Biscuit w/Egg, any size drink

a. The #4 position can be used as a flexible option with provided options being McLean Deluxe, 2 Chicken Fajitas, Filet-O-Fish, or Hotcakes during Breakfast.

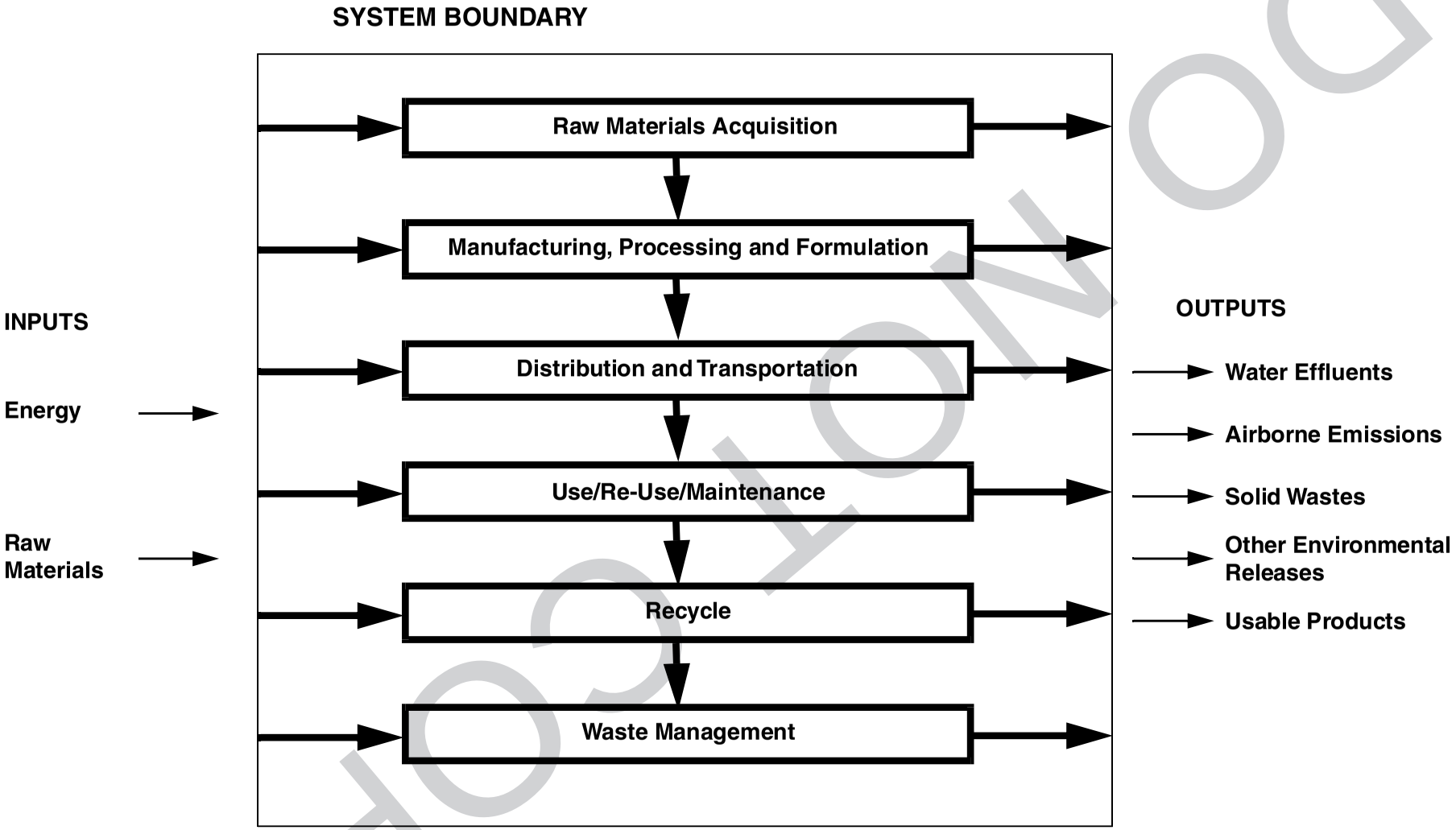
Exhibit 3 Summary of McDonald's On-Premise Waste Characterization Study[1]

OVER THE COUNTER (OTC)		BEHIND THE COUNTER (BTC)	
	% of Grand Total		% of Grand Total
Uncoated Paper	4%	Corrugated	34%
Coated Paper	7%	Putrescibles	34%
Polystyrene	4%	LDPE	2%
Non-McDonald's Waste	4%	HDPE	1%
Miscellaneous	2%	Liquids	2%
		Miscellaneous	6%
TOTALS	21%		79%
GRAND TOTAL 238 lbs./day/restaurant 0.12 lbs per customer served			

DEFINITIONS AND EXAMPLES	
OVER THE COUNTER	Waste in the customer sit-down area and from outside waste receptacles
BEHIND THE COUNTER	Waste behind the register counter, including kitchen and storage rooms
POLYSTYRENE	Hot cups and lids, cutlery, salad containers
MISCELLANEOUS OTC	Condiment packaging
CORRUGATED	Shipping Boxes
PUTRESCIBLES	Food waste from customers, egg shells, coffee grounds, other food scraps.
LDPE	Low-density polyethylene film wraps and plastic sleeves used as inner packaging in shipping containers
HDPE	High density polyethylene plastic mostly used for jugs, e.g. syrup jugs.
LIQUIDS	Excess, non-absorbed liquids measured during waste audit
MISC. BTC.	Durables, equipment, office paper, secondary packaging other than corrugated boxes.

1. Based on a two-restaurant, one-week-long waste audit performed 11/12-11/18/90 in Denver, CO and Sycamore, IL. Figures have been adjusted to reflect conversion from sandwich foam to paper wraps. Adapted from Page 31 of the Task Force Report.

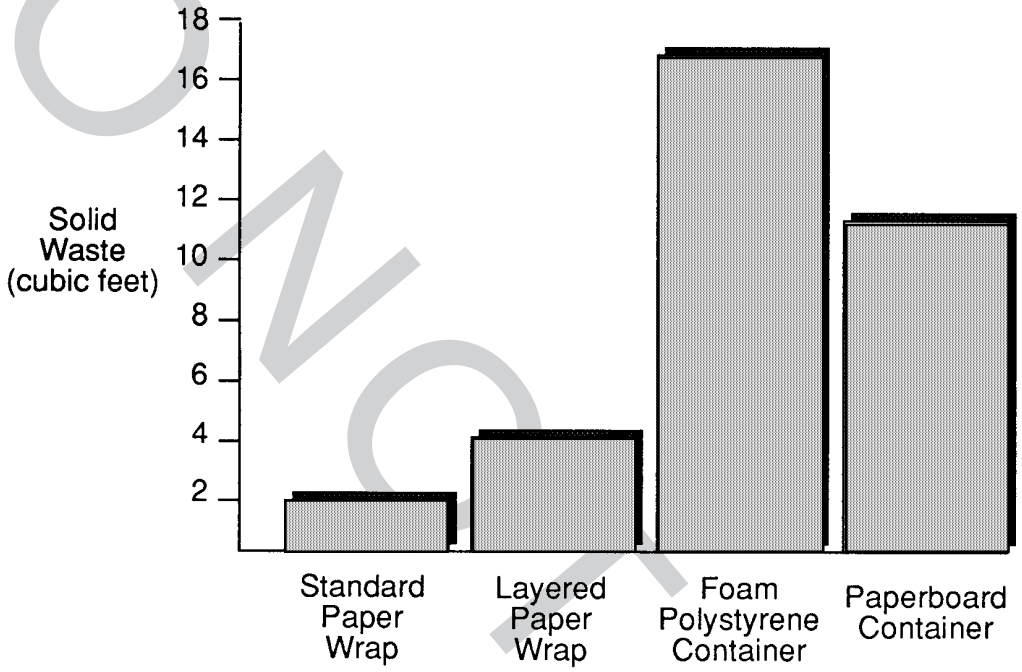
Exhibit 4 Scope of a Lifecycle Assessment



Each of the phases of the lifecycle are examined with respect to inputs and outputs, environmental impacts arising from them, and potential improvements that could reduce such impacts

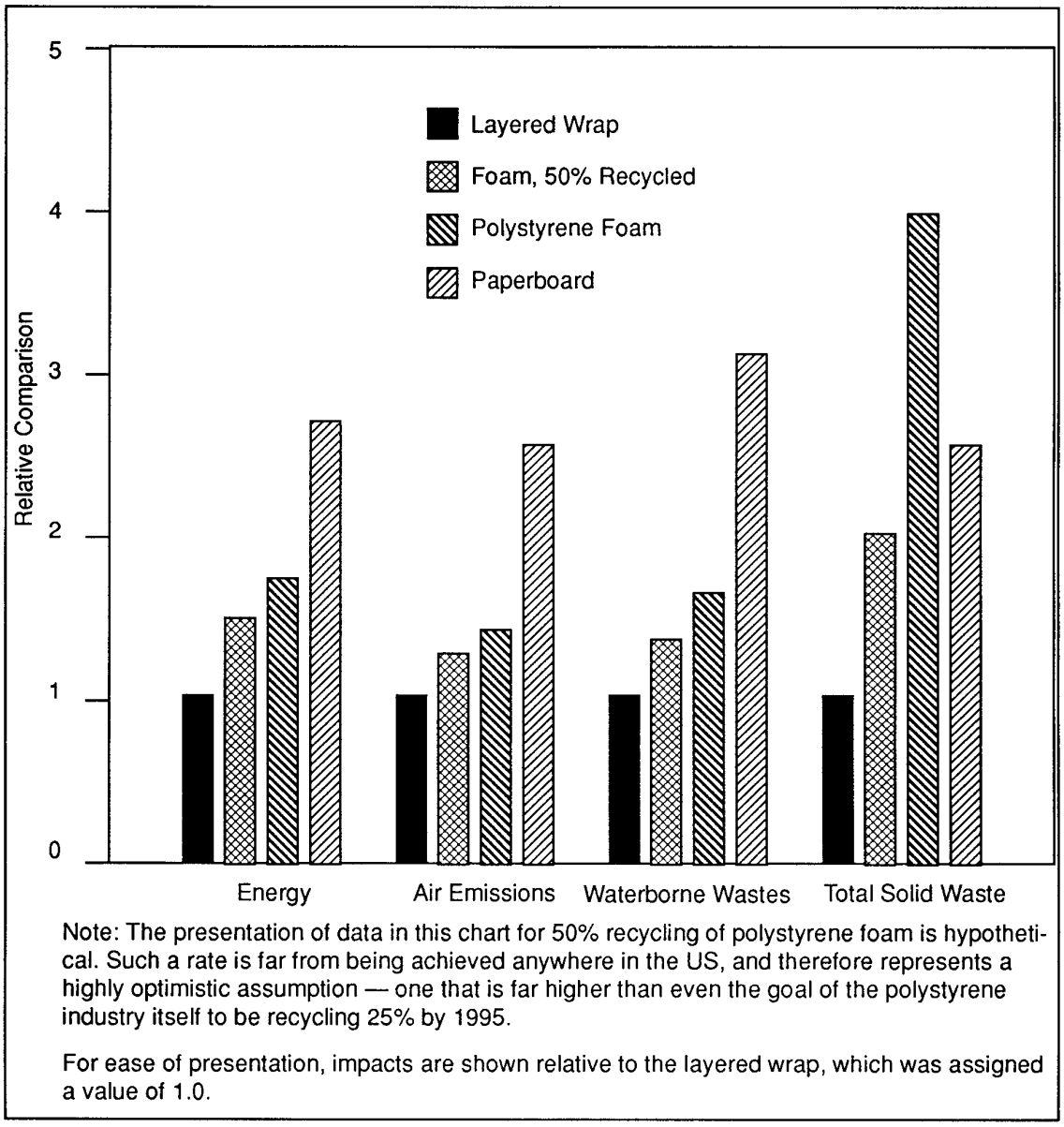
Source: Society for Environmental Toxicology and Chemistry, "A Technical Framework for Lifecycle Assessment," Washington, DC. January, 1991.

Exhibit 5 Total Solid Waste for Sandwich Packaging per 10,000 units



Adapted from "Resource and Environmental Analysis of Sandwich Wraps" by Franklin Associates, Ltd. for Perseco, 1991.

Exhibit 6 Environmental Comparison of Packaging Alternatives



Note: The presentation of data in this chart for 50% recycling of polystyrene foam is hypothetical. Such a rate is far from being achieved anywhere in the US, and therefore represents a highly optimistic assumption — one that is far higher than even the goal of the polystyrene industry itself to be recycling 25% by 1995.

For ease of presentation, impacts are shown relative to the layered wrap, which was assigned a value of 1.0.

Adapted from Waste Reduction Task Force, Final Report, Page 41.