



JANICE H. HAMMOND

## Barilla SpA (A)

Giorgio Maggiali was becoming increasingly frustrated. As director of logistics for the world's largest pasta producer, Barilla SpA<sup>1</sup>, he was acutely aware of the growing burden that demand fluctuations imposed on the company's manufacturing and distribution system. Since his appointment in 1988 as director of logistics, he had been trying to make headway on an innovative idea proposed by Brando Vitali, who had served as Barilla's director of logistics before Maggiali. The idea, which Vitali called Just-in-Time Distribution (JITD), was modeled after the popular "Just-In-Time" manufacturing concept. In essence, Vitali proposed that, rather than follow the traditional practice of delivering product to Barilla's distributors on the basis of whatever orders those distributors placed with the company, Barilla's own logistics organization would instead specify the "appropriate" delivery quantities—those that would more effectively meet end-consumer's needs yet would also more evenly distribute the workload on Barilla's manufacturing and logistics systems.

For two years Maggiali, a strong supporter of Vitali's proposal, had tried to implement the idea, but now, in the spring of 1990, little progress had been made. It seemed that Barilla's customers were simply unwilling to give up their authority to place orders as they pleased; some were even reluctant to provide the detailed sales data upon which Barilla could make delivery decisions and improve its demand forecasts. Perhaps more disconcerting was the internal resistance from Barilla's own sales and marketing organizations, which saw the concept as infeasible or dangerous, or both. Perhaps it was time to discard the idea as simply unworkable. If not, how might he increase the chances that the idea would be accepted?

### Company Background

Barilla was founded in 1875 when Pietro Barilla opened a small shop in Parma, Italy on via Vittorio Emanuele. Adjoining the shop was the small "laboratory" Pietro used to make the pasta and bread products he sold in his store. Pietro's son Ricardo led the company through a significant period of growth, and in the 1940s, passed the company to his own sons, Pietro and Gianni. Over time, Barilla evolved from its modest beginnings into a large, vertically integrated corporation with flour mills, pasta plants, and bakery-product factories located throughout Italy.

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<sup>1</sup>SpA (*Società per Azioni*) can be translated as "Society for Stockholders" and interpreted as "Inc."

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Professor Janice H. Hammond prepared this case. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

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In the 1960s, competing in a crowded field of over 2,000 Italian pasta manufacturers, Pietro and Gianni Barilla differentiated their company using a high quality product supported by innovative marketing programs. Barilla revolutionized the Italian pasta industry's marketing practices by creating a strong brand name and image for its pasta, selling pasta in a sealed cardboard box with a recognizable color pattern, rather than in bulk, and investing in large-scale advertising programs. In 1968, to support the double-digit sales growth the company experienced during the 1960s, Pietro and Gianni Barilla began construction of a 1.25 million square meter state-of-the-art pasta plant in Pedrignano, a rural town 5 km outside of Parma.

The cost of this massive facility—the largest and most technologically advanced pasta plant in the world—drove the Barilla brothers deeply into debt. In 1971, they sold the company to the American multi-national firm W. R. Grace, Inc. Grace brought additional capital investment and professional management practices to the company and launched an important new Mulino Bianco ("White Mill") line of bakery products. Throughout the 1970s, facing difficult economic conditions and new Italian legislation that both capped retail pasta prices and increased cost-of-living allowances for employees, Grace struggled to make its Barilla acquisition pay off. In 1979, Grace sold the company back to Pietro Barilla, who by then had secured the necessary funds to purchase it.

The capital investments and organizational changes that Grace had brought to Barilla, combined with improving market conditions, helped Pietro Barilla launch a successful return to the company. During the 1980s, Barilla enjoyed an annual growth rate of over 21% (see Exhibit 1). Growth was realized through expansion of existing businesses, both in Italy and other European countries, as well as through acquisition of new, related businesses.

In 1990, Barilla was the largest pasta manufacturer in the world, making 35% of all pasta sold in Italy and 22% of all pasta sold in Europe. In Italy, Barilla offered pasta products under three brands: the traditional Barilla brand represented 32% of the market and 3% of market share was divided between its Voiello brand (a traditional Neapolitan pasta competing in the high-priced segment of the semolina pasta market) and its Braibanti brand (a high-quality, traditional Parmesan pasta made from eggs and semolina). About half of Barilla's pasta was sold in northern Italy and half in the south, where Barilla held a smaller share of the market than in the north but where the market was larger. In addition, Barilla held a 29% share of the Italian bakery-products market.

In 1990, Barilla was organized into seven divisions: three pasta divisions (Barilla, Voiello, and Braibanti), the Bakery Products Division (manufacturing medium to long shelf-life bakery products), the Fresh Bread Division (manufacturing very short shelf-life bakery products), the Catering Division (distributing cakes and frozen croissants to bars and pastry shops), and the International Division. (Exhibits 2 and 3 show the organizational structure of the company.) Corporate headquarters were located adjacent to the Pedrignano plant.

## Industry Background

The origins of pasta are unknown. Some believe it originated in China and was first brought to Italy by Marco Polo in the 13th century. Others claim that pasta's origins were rooted in Italy, citing as proof a bas relief on a 3rd century tomb located near Rome that depicts a pasta roller and cutter. "Regardless of its origins," Barilla marketing literature proclaimed, "since time immemorial, Italians have adored pasta." Per capita pasta consumption in Italy averaged nearly 18 kilos per year, greatly exceeding that of other western European countries (see Exhibit 4). Total pasta consumption was relatively consistent throughout the year. A few pasta types experienced some seasonality—for

example, special pasta types were used for pasta salads in the summer and egg pasta and lasagna were very popular for Easter meals.

In the late 1980s, the Italian pasta market as a whole was relatively flat, growing less than 1% per year. By 1990, the Italian pasta market was estimated at 3.5 trillion lire. Semolina pasta and fresh pasta were the only growth segments of the Italian pasta market. In contrast, the export market was experiencing record growth; pasta exports from Italy to other European countries were expected to rise as much as 20-25% per year in the early 1990s.

## Plant Network

Barilla owned and operated an extensive network of plants located throughout Italy (see Exhibit 5), including flour mills, pasta plants, and fresh bread plants, as well as plants producing specialty products such as *panettone* (Christmas cake) and croissants. In Pedrignano, Barilla maintained state-of-the-art R&D facilities and a pilot production plant for developing and testing new products and production processes.

### *Pasta Manufacturing*

The pasta-making process is similar to the process by which paper is made (see Exhibit 6). In Barilla plants, flour and water (and for some products, eggs and/or spinach meal) were mixed to form dough, which was then rolled into a long, thin continuous sheet by sequential pairs of rollers set at increasingly close tolerances. After being rolled to the desired thickness, the dough sheet was forced through a bronze extruding die screen; the die's design gave the pasta its distinctive shape. After passing through the extruder, the pasta was cut to a specified length. The cut pieces then were hung over dowels (or placed onto trays) and moved slowly through a long tunnel kiln that snaked across the factory floor. The temperature and humidity in the kiln were precisely specified for each size and shape of pasta and had to be tightly controlled to ensure a high quality product. To keep changeover costs low and product quality high, Barilla followed a carefully chosen production sequence that minimized the incremental changes in kiln temperature and humidity between pasta shapes. After completing this four-hour drying process, the pasta was weighed and packaged.

At Barilla, raw ingredients were transformed to packaged pasta on fully-automated 120-meter-long production lines. In the Pedrignano plant, the largest and most technologically advanced of Barilla's plants, 11 lines produced a total of 9,000 quintals (900,000 kilos) of pasta each day. Barilla employees used bicycles to travel within this enormous facility.

Barilla's pasta plants were specialized by the type of pasta produced in the plant. The primary distinctions were based on the composition of the pasta, for example, whether it was made with or without eggs or spinach, and whether it was sold as dry or fresh pasta. All of Barilla's non-egg pasta was made with flour ground from *grano duro* (high protein "hard" durum wheat), the highest-quality flour for making traditional pasta products. Semolina, for example, is a finely ground durum wheat flour. Barilla used flours made from *grano tenero* (tender wheat), such as farina, for more delicate products, like egg pasta and bakery products. Barilla's flour mills ground flour made from both types of wheat.

Even within the same family of pasta products, individual products were assigned to plants based on the size and shape of the pasta. "Short" pasta products, such as macaroni or fusilli, and "long" products, such as spaghetti or capellini, were made in separate facilities due to the different sizes of equipment required.

## Channels of Distribution

Barilla divided its product line into "dry" and "fresh" product categories, representing 75% and 25% of Barilla's sales, respectively.

- **Dry products** included dry pasta and longer shelf-life bakery products such as cookies, biscuits, flour, bread sticks, and dry toasts. Dry products had either "long" shelf lives of 18 to 24 months (e.g., pasta and dried toasts) or "medium" shelf lives of 10 to 12 weeks (e.g., cookies). In total, Barilla dry products were offered in about 800 different packaged SKUs. Pasta was made in 200 different shapes and sizes and was sold in over 470 different packaged SKUs (see Exhibit 7). The most popular pasta products were offered in a variety of packaging options; for example, at any one time Barilla's #5 spaghetti might be offered in a 5-kg package, a 2-kg package, a 1-kg package with a northern Italian motif, a 1-kg package with a southern Italian motif, a 0.5-kg "northern-motif" package, a 0.5-kg "southern-motif" package, a special promotional package with a free bottle of Barilla pasta sauce, and a display pallet.
- **Fresh products** included fresh pasta products, which had 21-day shelf lives, and fresh bread, which had a one-day shelf life.

Most Barilla products were shipped from the plants in which they were made to one of two Barilla central distribution centers (CDCs): the Northern CDC in Pedrignano or the Southern CDC in the outskirts of Naples (See Exhibit 8). Fresh products were moved quickly through the distribution system—only three days worth of fresh product inventory was typically held in each of the CDCs; in contrast, each CDC held about a month's worth of dry product inventory. Certain fresh products, such as fresh bread, did not flow through the CDCs.

Barilla maintained different distribution systems for its dry and fresh products due to their differences in perishability and retail service requirements. Fresh products were purchased from the two CDCs by independent agents (*concessionari*) who then channeled the product through 70 regional warehouses located throughout Italy. Each of these warehouses held about three days of fresh product in inventory.

Nearly two-thirds of Barilla's dry products were destined for supermarkets; these products were first shipped to one of Barilla's CDCs, from which they were purchased by distributors. The distributors in turn shipped the product to supermarkets. Brando Vitali's JITD proposal focused solely on dry products sold through distributors. The remainder of the dry products was distributed through 18 Barilla-owned "depots" (small warehouses), mostly to small shops.

Barilla products were distributed through three types of retail outlets: small independent grocers, supermarket chains, and independent supermarkets. In sum, Barilla estimated that its products were offered in 100,000 retail outlets in Italy alone.

### 1. *Small Independent Shops*

Small shops were more prevalent in Italy than in other Western European countries (see Exhibits 9 and 10). Through the late 1980s, the Italian government had supported small grocers (often referred to as "Signora Maria" shops in Italy) by restricting the number of licenses provided to operate large supermarkets. In the early 1990s, the number of supermarkets began to grow as governmental restrictions abated.

Approximately 35% of Barilla's dry products (30% in the north of Italy and 40% in the south) were distributed from Barilla's internally-owned regional warehouses to small independent shops, which typically held over 2 weeks of inventory at the store level. Small shop owners purchased product through brokers that dealt with Barilla purchasing and distribution personnel.

## 2. Supermarkets

The remaining dry products were distributed through outside distributors to supermarkets—70% to supermarket chains and 30% to independent supermarkets. A supermarket typically held from ten to twelve days of dry-grocery inventory within the stores, and on average carried a total of 4,800 dry-product SKUs. Although Barilla offered many pasta products in multiple package types, most retailers would carry the product in only one (and at most two) packaging options.

Dry products destined for a supermarket chain were distributed through the chain's own distribution organization, known as a "*Grande Distribuzione*" (Large Distributor) or GD; those destined for an independent supermarket were channeled through a distributor known as a "*Distribuzione Organizzata*" (Organized Distributor) or DO. A DO acted as a centralized buying organization for a large number of independent supermarkets. Most DOs had regional operations, and the retailers they served usually sourced product from only a single DO.

Due to regional preferences and differences in retail requirements, a typical distributor might distribute 150 of Barilla's 800 dry-product SKUs. Most distributors handled products coming from about 200 different suppliers; of these, Barilla typically would be the largest in terms of the physical volume of product purchased. Distributors typically carried from 7,000 to 10,000 SKUs in total. However, distributors' strategies varied. For example, one of Barilla's largest DOs, Cortese, carried only 100 of Barilla's dry products and carried only 5,000 SKUs in total.

Both GDs and DOs purchased product from the Barilla CDCs, maintained inventory in their own warehouses, and then filled supermarkets' orders out of their warehouse inventory. A distributor's warehouse typically held a two-week supply of Barilla dry products in inventory.

Many supermarkets placed orders with distributors daily; the store manager would walk up and down the store aisles and would note each product that needed to be replenished and the number of boxes required (the more sophisticated retailers used hand-held computers to record order quantities as they checked store shelves). The order would then be transmitted to the store's distributor; deliveries were typically received at the store 24 to 48 hours after the receipt of the order at the distribution center.

## Sales and Marketing

Barilla enjoyed a strong brand image in Italy. Its marketing and sales strategy was based upon a combination of advertising and promotions.

### *Advertising*

Barilla brands were heavily advertised. Advertising copy differentiated Barilla pasta from basic commodity "noodles" by positioning the brand as the highest quality, most sophisticated pasta product available. One ad campaign was built on the phrase: "Barilla: a great collection of premium Italian pasta." The "collection" dimension was illustrated by showing individual uncooked pasta

shapes, as though they were jewels, against a black background, evoking a sense of luxury and sophistication (see Exhibit 11). Unlike other pasta manufacturers, Barilla avoided images of traditional Italian folklore, preferring modern, sophisticated settings in major Italian cities.

Advertising themes were supported by sponsorships of well-known athletes and celebrities. For example, Barilla engaged tennis stars Steffi Graf to promote Barilla products in Germany and Stefan Edberg to promote Barilla products in Scandinavian countries. Luminaries such as Paul Newman were also used to promote Barilla products. In addition, Barilla advertising focused on developing and strengthening loyal relationships with Italian families by using messages such as "Where there is Barilla, there is a home."

### *Trade Promotions*

Barilla's sales strategy relied on the use of trade promotions to push product into the grocery distribution network. A Barilla sales executive explained the logic of the promotion-based strategy:

We sell to a very old-fashioned distribution system. The buyers expect frequent trade promotions, which they then pass along to their own customers. So a store will know right away if another store is buying Barilla pasta at a discount.

You have to understand how important pasta is in Italy. Everyone knows the price of pasta. If a store is selling pasta at a discount one week, consumers notice the reduced price immediately.

Barilla divided each year into 10 or 12 "canvass" periods, typically four to five weeks in length, each corresponding to a promotional program. During any canvass period, a Barilla distributor could buy as much product as desired to meet current and future needs. Incentives for Barilla sales representatives were based on achieving sales targets set for each canvass period. Different product categories were offered during different canvass periods, with the discount depending on the margin structure of the category; typical promotional discounts were 1.4% for semolina pasta, 4% for egg pasta, 4% for biscuits, 8% for sauces and 10% for breadsticks.

Barilla also offered volume discounts. For example, Barilla paid for transportation to distributors, and offered incentives of 2% to 3% for orders in full truck-load quantities. In addition, a sales representative might offer a buyer a 1,000 lire/carton discount (representing a 4% discount) if the buyer purchased a minimum of three truck-loads of Barilla egg pasta.

### *Sales Representatives*

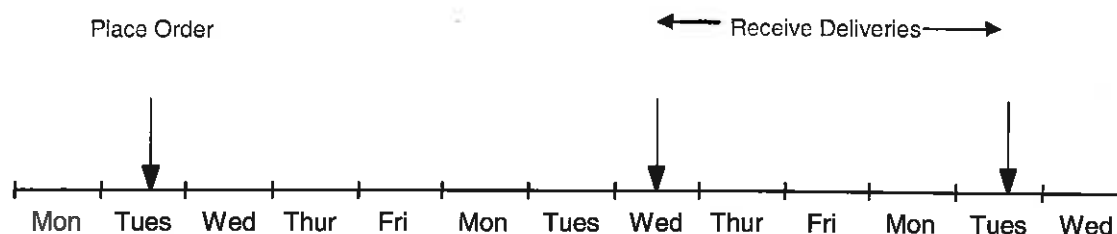
Barilla sales representatives serving DOs spent an estimated 90% of their time working at the store level. In the store, sales reps helped merchandise Barilla product and set up in-store promotions; took note of competitive information including competitors' prices, stockouts, and new product introductions; and discussed Barilla products and ordering strategies with store management. In addition, each sales rep spent half a day in a regularly scheduled weekly meeting with the distributor's buyer, helping the distributor place its weekly order, explaining promotions and discounts, and settling problems such as returns and deletions associated with the last delivery. Each rep carried a portable computer for inputting distributor orders. The rep would also spend a few hours a week at the CDC, discussing new products and prices, discussing problems associated with the previous week's deliveries, and settling disputes about different discounts and deal structures.

In contrast, a very small sales force served the GDs. The GD sales force rarely visited the GD's warehouses; GDs usually sent their orders to Barilla via fax.

## Distribution

### *Distributor Ordering Procedures*

Most distributors—GDs and DOs alike—checked their inventory levels and placed orders with Barilla once per week. Barilla product would then be shipped to the distributor over the course of the week that started eight days after the order was placed and ended fourteen days after the order was placed—the average lead time was ten calendar days. Thus for example, a large distributor that ordered every Tuesday might order several truckloads that would be delivered from the following Wednesday through the following Tuesday (see below). Distributors' sales volumes varied; small distributors might order only one truckload per week whereas the largest warranted deliveries of as many as five truckloads per week.



Most distributors used simple periodic-review inventory systems. For example, a distributor might review inventory levels of Barilla products each Tuesday; the distributor would then place orders for those products whose levels fell below a specified reorder level. Nearly all of the distributors had computer-supported ordering systems, but few had sophisticated forecasting systems or analytical tools for determining order quantities.

### *Impetus for the JITD Program*

As the 1980s progressed, Barilla increasingly felt the effects of fluctuating demand. Orders for Barilla dry products often swung wildly from week to week (see **Exhibit 12**). Such extreme demand variability strained Barilla's manufacturing and logistics operations. For example, the specific sequence of pasta production necessitated by the tight heat and humidity specifications in the tunnel kiln made it difficult to quickly produce a particular pasta that had been sold out due to unexpectedly high demand. On the other hand, holding sufficient finished goods inventories to meet distributors' order requirements was extremely expensive when weekly demand fluctuated so much and was so difficult to predict.

Some manufacturing and logistics personnel favored asking distributors or retailers to carry additional inventory to dampen the fluctuation in distributors' orders, noting that with their current inventory levels, many distributors' service levels to the retailers were unacceptable (see **Exhibit 13** for sample distributor inventory levels and stock-out rates). Others felt that the distributors and

retailers were already carrying too much inventory. In an interview in the late 1980s, a Barilla logistics manager discussed retail inventory pressure:

Our customers are changing. And do you know why they are changing? As I see it, they are realizing they do not have enough room in their stores and warehouses to carry the very large inventories manufacturers would like them to. Think of shelf space in retail outlets. You cannot easily increase it. Yet manufacturers are continuously introducing new products, and they want retailers to display each product on the fronts of their shelves! That would be impossible even if supermarket walls were made from rubber!<sup>2</sup>

Distributors felt similar pressure, both to increase inventory of items they already stocked and to add items they currently did not carry to their product offerings.

In 1987, Brando Vitali, then Barilla's director of logistics, had expressed strong feelings that an alternative approach to order fulfillment must be found. At that time, he noted, "Both manufacturers and retailers are suffering from thinning margins; we must find a way to take costs out of our distribution channel without compromising service." Vitali was seen as a visionary whose ideas stretched beyond the day-to-day details of a logistics organization. He envisioned an approach that would radically change the way in which the logistics organization managed product delivery. In early 1988, Vitali explained his plan:

I envision a simple approach: rather than send product to the distributors according to their internal planning processes, we should look at all of the distributors' shipment data and send only what is needed at the stores—no more, no less. The way we operate now it's nearly impossible to anticipate demand swings, so we end up having to hold a lot of inventory and do a lot of scrambling in our manufacturing and distribution operations to meet distributor demand. And even so, the distributors don't seem to do such a great job servicing their retailers. Look at the stockouts (see Exhibit 13) these DOs have experienced in the last year. And that's despite their holding a couple of weeks of inventory!!

In my opinion, we could improve operations for ourselves *and* our customers if *we* were responsible for determining the quantities and delivery schedules. We'd be able to ship product only as it is needed, rather than building enormous stocks in both of our facilities. We could try to reduce our own distribution costs, inventory levels, and ultimately our manufacturing costs if we didn't have to respond to the volatile demand patterns of the distributors.

We have always had the mentality that orders were an unchangeable input into our process and therefore that one of the most important capabilities we needed to achieve was flexibility to respond to those inputs. But in reality, demand from the end-consumer is the input and I think that we should be able to manage the input filter that produces the orders.

How would this work? Every day each distributor would provide us data on what Barilla products it had shipped out of its warehouse to retailers during the previous day, as well as the current stock level for each Barilla SKU. Then we could look at all of the data and make replenishment decisions based on our own forecasts. It would be similar to using point-of-sale data from retailers—we would just be responding to sell-through information one step behind the retailer. Ideally, we would use actual retail sell-through data, but that's hard to come by given the structure of our distribution channel and the fact that most grocers in Italy aren't equipped yet with the necessary bar-code scanners and computer linkages.

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<sup>2</sup>"The Pedrignano Warehouse," by Claudio Ferrozzi, ©1988 by GEA, Milan, Italy.



Of course, it's not quite as simple as that. We need to improve our own forecasting systems so we can make better use of the data we receive. We'll also need to develop a set of decision rules that we can use to determine what to send after we've received new data and made new forecasts.

Vitali's proposal, "Just-in-Time Distribution," met with significant resistance within Barilla. The sales and marketing organizations were particularly vocal in their opposition to the plan. A number of sales representatives felt that their responsibilities would be diminished if such a program were put in place. A range of concerns were expressed from the bottom to the top of the sales organization. The following remarks were heard from Barilla sales and marketing personnel:

"Our sales levels would flatten if we put this program in place."

"We run the risk of not being able to adjust our shipments sufficiently quickly to changes in selling patterns or increased promotions."

"It seems to me that a pretty good part of the distribution organization is not yet ready to handle such a sophisticated relationship."

"If space is freed up in our distributors' warehouses when inventories of our own product decrease, we run the risk of giving our competitors more of the distributors' shelf space. The distributors would then push our competitors' product more than our own, since once something is bought it must be sold."

"We increase the risk of having our customers stock out of our product if we have disruption in our supply process. What if we have a strike or some other disturbance?"

"We wouldn't be able to run trade promotions with JITD. How can we get the trade to push Barilla product to retailers if we don't offer some sort of incentive?"

"It's not clear that costs would even be reduced. If a DO decreases its stock, we at Barilla may have to increase our own inventory of those products for which we can't change production schedules due to our lack of manufacturing flexibility."

Vitali countered the concerns of the sales organization:

I think JITD should be considered a selling tool, rather than a threat to sales. We're offering the customer an additional service at no extra cost. The program will improve Barilla's visibility with the trade and make distributors more dependent on us—it should improve the relationships between Barilla and the distributors rather than harm them. And what's more, the information regarding the supply at the distributors' warehouses would provide us with objective data that would permit us to improve our own planning procedures.

Giorgio Maggiali, head of materials management for Barilla's fresh products group, was appointed director of logistics in late 1988 when Vitali was promoted to head one of the company's new divisions. Maggiali was a hands-on manager, known for his orientation to action. Shortly after his appointment, Maggiali appointed a recent college graduate, Vincenzo Battistini, to help him develop and implement the JITD program.

Maggiali recounted his frustrations in implementing the JITD program:

In 1988, we developed the basic ideas for the approach we wanted to use and tried to convince several of our distributors to sign on. They weren't even interested in talking about it; the manager of one of our largest distributors pretty much summed up a lot of the responses

we had when he cut off a conversation saying, 'Managing stock is *my* job; I don't need you to see my warehouse or my figures. I could improve my inventory and service levels myself if you would deliver my orders more quickly. In fact, *I'll* make *you* a proposal—I'll place the order and you deliver within 36 hours.' He didn't understand that we just can't respond to wildly changing orders without more notice than that. Another distributor expressed concerns about becoming too closely linked to Barilla. 'We would be giving Barilla the power to push product into our warehouses just so Barilla can reduce its costs.' Still another asked, 'What makes you think that you could manage my inventories any better than I can?'

We were finally able to convince a couple of our distributors to have in-depth discussions about the JITD proposal. Our first discussion was with Marconi, a large, fairly old-fashioned GD. First Battistini and I visited Marconi's logistics department and presented our plan. We made it clear that we planned to provide them with such good service that they could both decrease their inventories and improve their fill rate to their stores. The logistics group thought it sounded great, and was interested in conducting an experimental run of the program. But as soon as Marconi's buyers heard about it, all hell broke loose. First the buyers started to voice their own concerns, then, after talking to their Barilla sales reps, they started to repeat some of our own sales department's objections as well. Marconi finally agreed to *sell* us the data we wanted, but otherwise things would continue as before with Marconi making decisions about replenishment quantities and timing. This clearly wasn't the type of relationship we were looking for, so we talked to other distributors, but they weren't much more responsive.

We need to regroup now and decide where to go with JITD. Is this type of program feasible in our environment? If so, what kind of customers should we target? And how do we convince them to sign up?

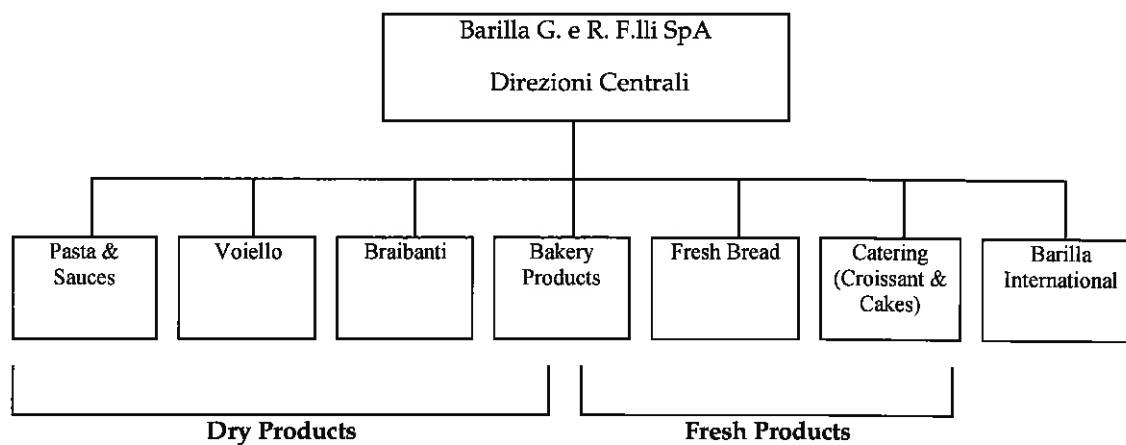
**Exhibit 1** Barilla Sales, 1960 – 1991

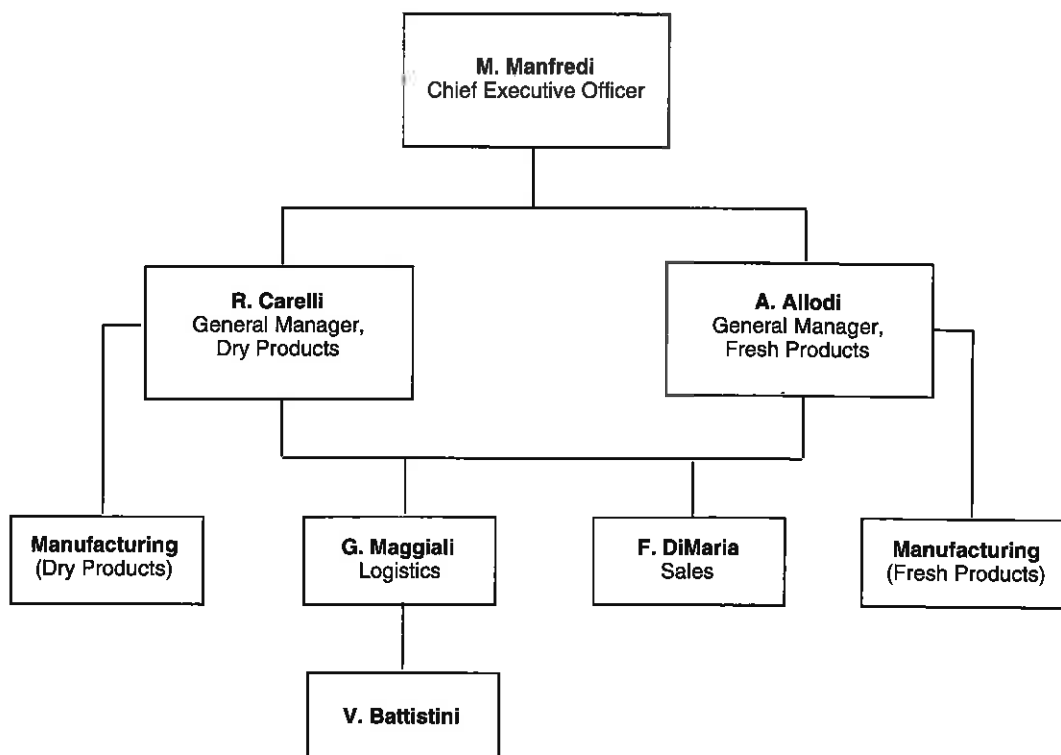
Year	Barilla Sales (Lire, Billions)	Italian Wholesale Price Index
1960	15	10.8
....		
1970	47	41.5
....		
1980	344	57.5
1981	456	67.6
1982	609	76.9
1983	728	84.4
1984	1,034	93.2
1985	1,204	100.0
1986	1,381	99.0
1987	1,634	102.0
1988	1,775	106.5
1989	2,068	121.7
1990	2,390 <sup>E</sup>	128.0 <sup>E</sup>

Source: Company Documents and *International Financial Statistics Yearbook*, International Monetary Fund.

Note: 1,198 lire  $\equiv$  US\$1 in 1990.

<sup>E</sup>1990 estimates.

**Exhibit 2** Barilla Group Structure

**Exhibit 3** Barilla Organization Chart, 1990**Exhibit 4** Per Capita Consumption of Pasta and Bakery Products, in Kilograms, 1990

Country	Bread	Breakfast		Pasta	Biscuits
		Cereals			
Belgium	85.5	1.0	1.7	5.2	
Denmark	29.9	3.7	1.6	5.5	
France	68.8	0.6	5.9	6.5	
W. Germany	61.3	0.7	5.2	3.1	
Greece	70.0	—	6.2	8.0	
Ireland	58.4	7.7	—	17.9	
Italy	130.9	0.2	17.8	5.9	
Netherlands	60.5	1.0	1.4	2.8	
Portugal	70.0	—	5.7	4.6	
Spain	87.3	0.3	2.8	5.2	
United Kingdom	43.6	7.0	3.6	13.0	
<b>Average</b>	<b>70.3</b>	<b>2.5</b>	<b>5.2</b>	<b>7.1</b>	

Source: Adapted from *European Marketing Data and Statistics 1992*, Euromonitor Plc 1992, p. 323.

Exhibit 5 Barilla Plant Locations and Products Manufactured, 1989

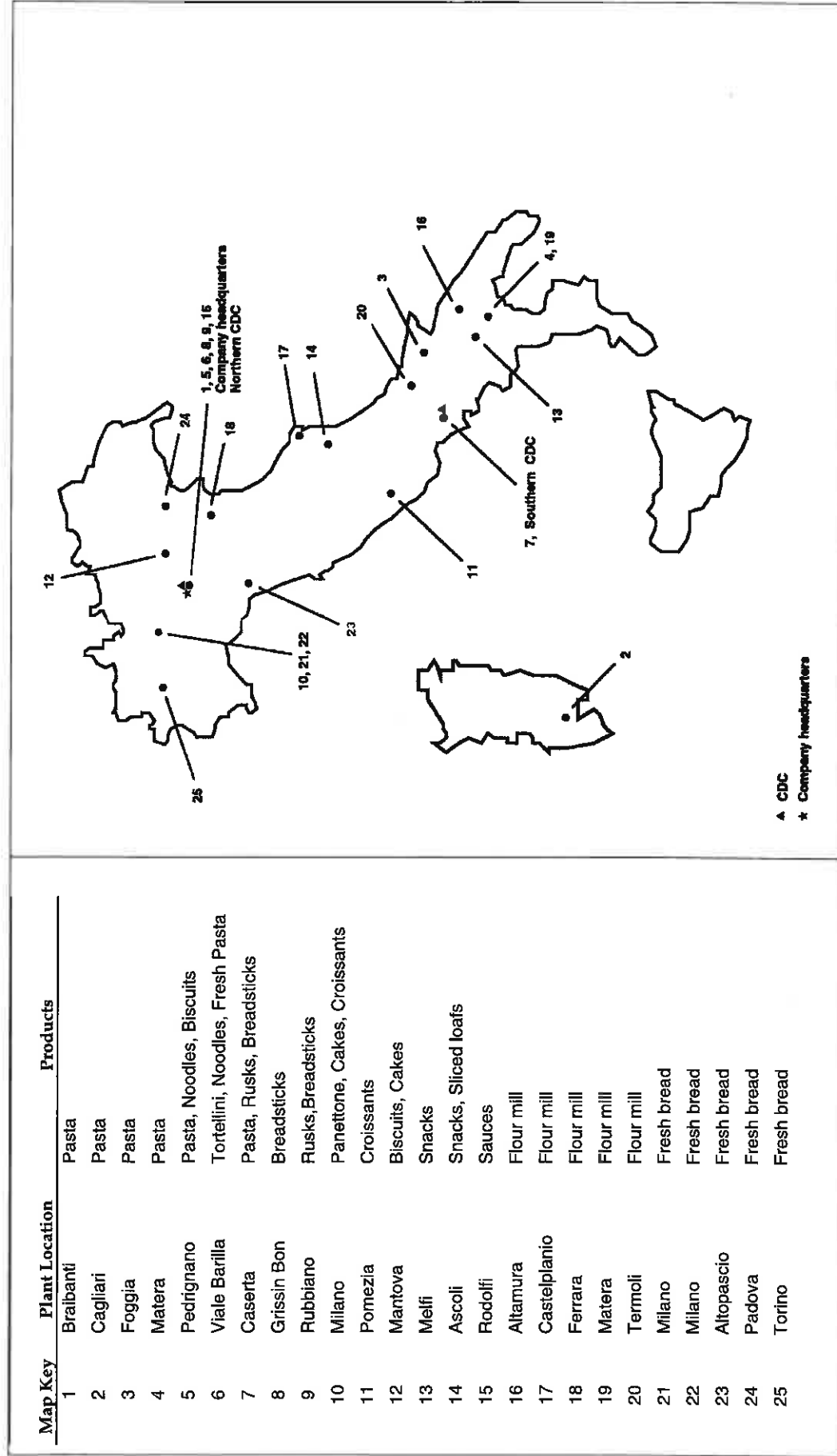


Exhibit 6 Manufacturing at Barilla

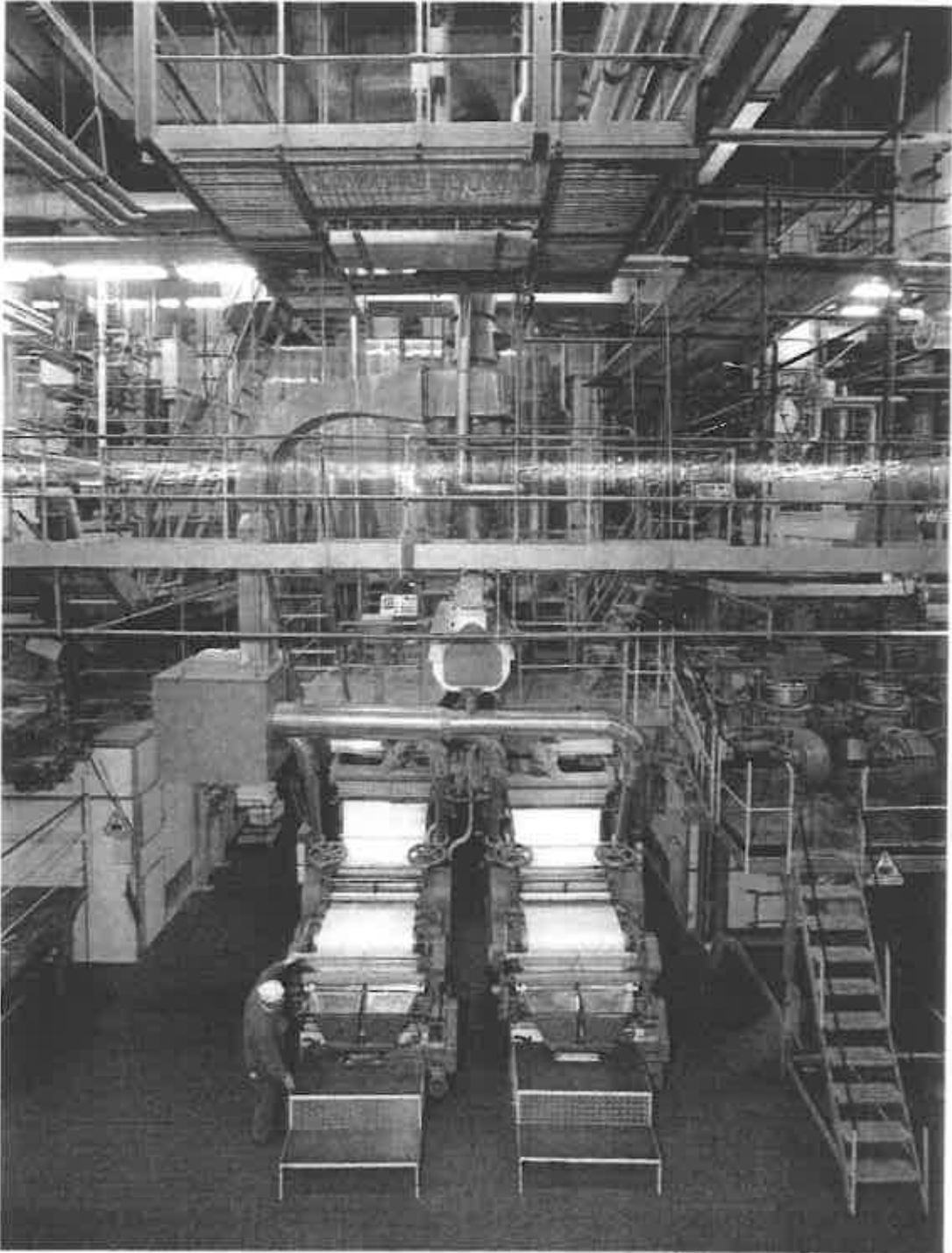
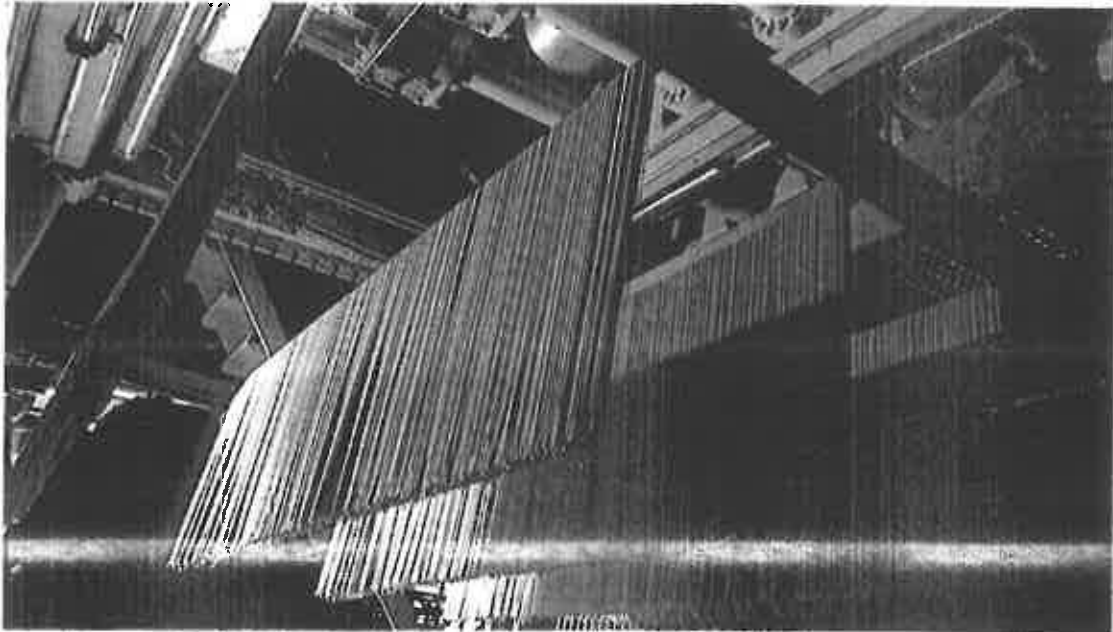
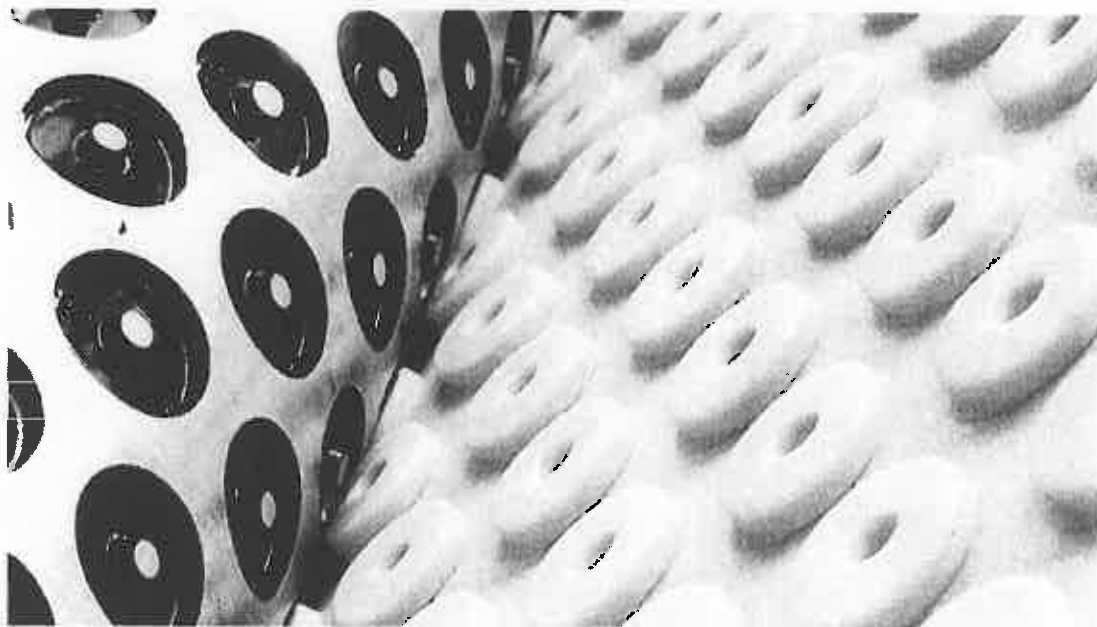


Exhibit 6 Continued



Pasta Drying in Barilla's Pedrignano Plant

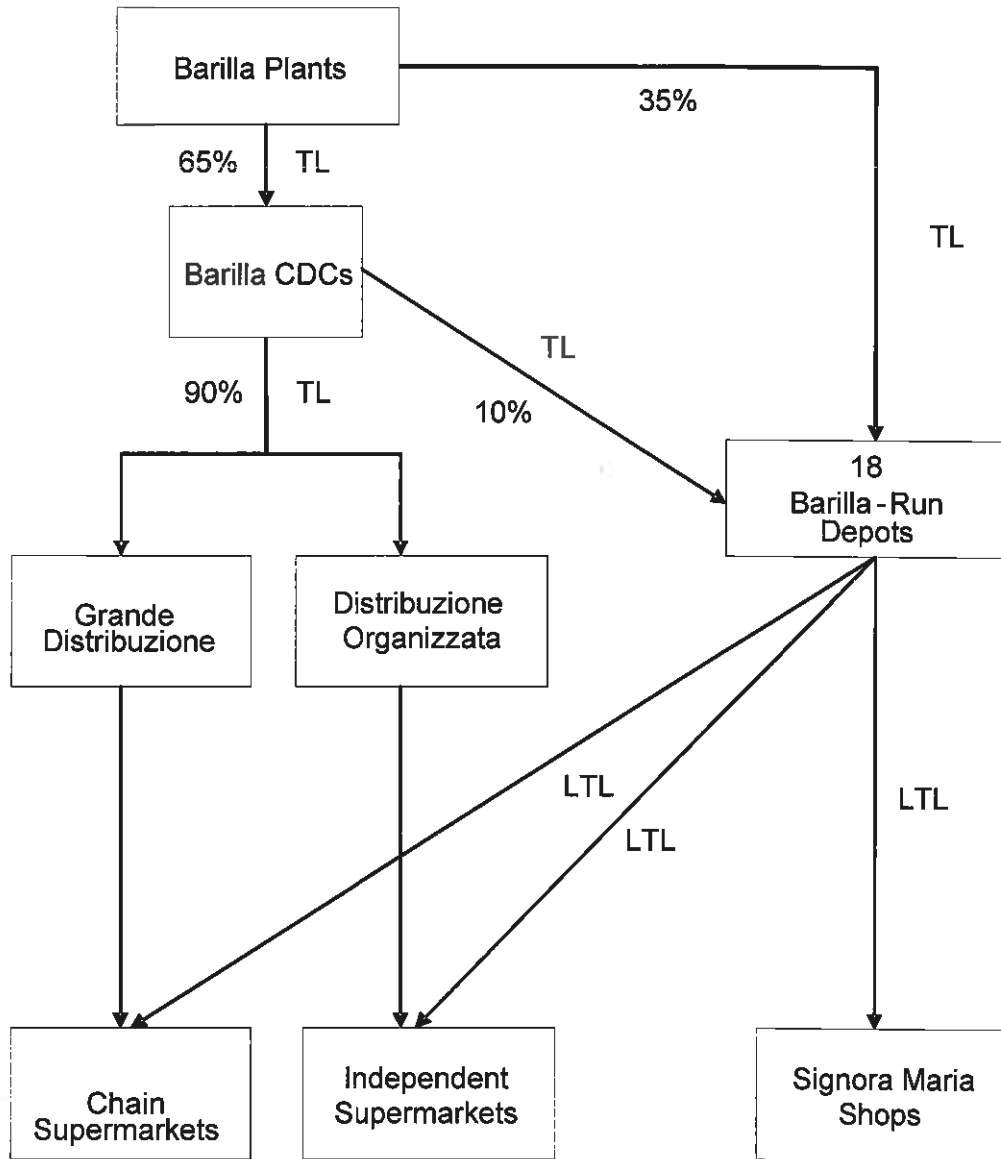


Rolling Die Forming Cookies in Barilla's Pedrignano Plant





Exhibit 8 Barilla Distribution Patterns for Dry Products



TL = Delivery in truck-load quantities

LTL = Delivery in less than truck-load quantities

Shipping percentages based on product weight

**Exhibit 9** Retail Trade in Western Europe, 1988

Country	Population (millions)	Retail Sales (million ECU)	Retail Sales per Inhabitant (ECU)	Commercial Shops (thousands)	Density (thousands of people per shop)
Austria	7.61	23.6	3.1	39.1	195
Belgium	9.88	34.8	3.5	113.7	87
Denmark	5.13	17.7	3.5	41.7	123
France	55.75	207.6	3.7	418.2	133
West Germany	61.14	233.0	3.8	415.0	147
Greece	9.98	17.6	1.8	171.5	58
Ireland	3.54	7.1	2.0	31.5	112
Italy	57.40	182.3	3.2	871.3	66
Luxembourg	0.37	1.4	3.8	3.7	101
Netherlands	14.72	39.3	2.7	156.2	94
Norway	4.21	15.2	3.6	39.1	108
Portugal	10.23	18.8	1.8	97.5	105
Spain	38.91	81.9	2.1	540.0	72
Sweden	8.41	34.4	4.1	63.4	133
Switzerland	6.56	32.1	4.9	54.4	121
United Kingdom	57.07	156.9	2.8	343.4	166
<b>Average</b>	<b>21.90</b>	<b>69.0</b>	<b>3.1</b>	<b>212.5</b>	<b>113.8</b>

Source: Adapted from Panorama of EC Industries 1991-1992, *Current Situation and Outlook for 180 Sectors of Manufacturing and Service Industries in the European Community*, ISBN #92-826-3103-6, p.12.

**Exhibit 10** Number of Food Outlets by Type: Latest Year

Country	Year	General	Fruit &				Bakery	Confectionery	Drinks	Tobacco
			Vegetable	Dairy	Meat	Fish				
Belgium	1987	14,209	2,359	2,367	8,165	1,431	2,198	1,190	1,686	664
Denmark	1987	6,497	1,319		1,622	474	457	504		1,992
France	1989	57,021	17,033	4,880	49,138	7,717		21,370	5,383	4,887
W. Germany	1985	59,592							7,895	10,469
Greece	1978	37,734	5,193	2,097	11,558	1,227	815	3,125	1,590	
Ireland	1988	6,575	501		1,954	149	506	2,882	1,405	
Italy	1986	197,709	43,545		66,542	9,965	56,685			
Netherlands	1989	8,349	6,154	4,637	6,109	1,837		1,557		
U.K.	1986	41,815	16,805	9,700	20,721	3,158	7,553			

Source: Adapted from *European Marketing Data and Statistics 1992*, Euromonitor Plc, p. 286.



Exhibit 12 Weekly Demand for Barilla Dry Products from Cortese's Northeast Distribution Center to the Pedrignano CDC, 1989

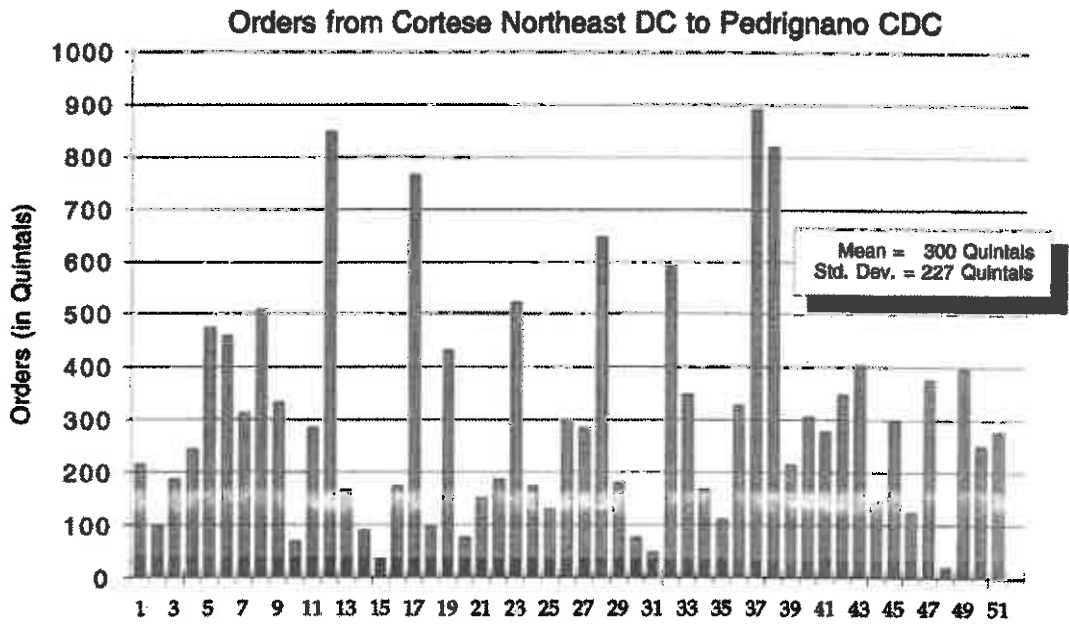


Exhibit 13 Sample Stockout and Inventory Levels, Cortese's Northeast Distribution Center, 1989

