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**THE LATIN AMERICAN PERSPECTIVE ON THE IMPACTS OF THE  
GLOBAL FOOD ECONOMY: THE CASE OF BRAZIL**

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**Abstract**

*Important institutional and economic changes in Latin America have resulted in a rapid consolidation and multinationalization of food processing and distribution. This paper focuses the supermarket sector in Brazil over the past decade and the impacts on processing sector. The dairy system is analysed as a case study that illustrates the changing competition rules in the food markets, the concentration 'upstream' in the chain and impacts on dairy farmers. Although the consumer has benefitted from the changes, for small farms and firms there is a need for substantial improvements in organisation and technology to face these challenges, and the government has a role in helping them make this adjustment.*

**1.Introduction**

Important institutional and economic changes in Latin America have resulted in a rapid consolidation and multinationalization of food processing and distribution. This paper examines the globalization process of the Latin American countries, focusing the Brazilian case.

Brazil is a strong player in the food global system scenario, with 170 million inhabitants, 8.5 million km<sup>2</sup> and US\$ 511 billion GDP in 2001<sup>1</sup>. Nearly 19% of world's arable land is in Brazil (FAO/ONU), but the country uses just 10% of this area. Within Mercosur, Brazil has 78 percent of the region's population and 62 % of the Mercosur's GDP. Regarding the internal market, Brazilian food consumption growth since the Stabilization Plan in 1994 (Real Plan) is astonishing, when compared to European and USA markets. Dairy products

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<sup>1</sup> Source:IBGE (Brazilian Institute of Geography and Statistics) in [www.ipeadata.gov.br](http://www.ipeadata.gov.br)

grew 25% in volume, while yogurt grew more than 80%. Moreover, the percentage of average family expenditure on dinners and lunch away from home grew 80%, while prepared foods almost doubled, as well as soft drinks, and hot and cold beverages.

The paper starts with a general presentation of the Latin American process of concentration cum multinationalization in the supermarket segments and the impacts on upstream segments of the food system (Reardon and Berguedé, 2002). The Brazilian experience is then discussed in detail. Last, the paper focuses on a case study of Brazilian dairy products to examine the effects on small farms and firms. This example is used because demand for dairy products is growing quickly, and because many small processors and farmers are involved in this chain.

## 2.Latin American perspective

In little more than a decade, supermarkets are rapidly taking over food retailing in Latin America. In 2000 they had roughly 60% on average of the national retail sectors in South America and Mexico. Supermarkets and large processors are becoming the main buyers in the food supply chain, even for fresh fruits and vegetables. Their procurement practices have a big impact on farmers and firms in the food chain through their coordinating institutions such as contracts, private standards, sourcing networks, and distribution centers.

Two crucial changes occurred in the region's supermarket sector during the last decade of the millennium. First, there was a rapid consolidation. By 2001, the share of top 5 chains in supermarket sales was over 70%, except for Brazil and Chile where it was around 50%. Second, there was rapid multinationalization. For 10 Latin American countries the share of multinationals is 56% on average, which is 86% of the market share of the top five chains per country. The multinational entry and growth have been driven by mergers and acquisitions, although these are gradually giving way to new store development.

The rapid rise of supermarkets, and consolidation in food processing segment has challenged small traditional stores and plaza markets. Many thousands of small shops went out of business and there was noted shrinkage in plaza markets. 64 thousand small shops went out of business in Argentina from 1984 to 1993, and 5 thousand in Chile. There are clear patterns of "big fish eats smaller fish, then bigger fish eats big fish, then giant fish eats bigger fish" in the dynamic growth pattern of the food processing. For example, the Uruguayan/Argentine chain Disco became larger by acquiring other Argentine firms, then the Chilean entered into a joint venture with Royal Ahold, which bought Disco in Argentina.

Supermarkets are everywhere in stiff competition to win customers. The incentives to cut costs and improve quality of product and service generally

produce an increase in scale and volume of procurement. In the case of dairy and other industrialized products the consumer was benefited by cheaper and better products. However, suppliers have to adjust to new requirements such as investments in physical, financial and human capital that are scarce for most small businesspeople. At the same time, supermarkets are a big opportunity as a motor for broadening and deepening the consumer market. To prepare the farmers to take advantage of those opportunities and meet those challenges requires a redesign of development strategy for the small farm and firms. It is worth mention that also the larger processors have been challenged by retailers and their relationship resembles the can't live with him, can't live without him syndrome. The fact is that they are growing together!

### 3.The Case of Brazil

Brazilian food system has been heavily affected by a handful of institutional and economic changes since the end of 80's. Trade liberalization, deregulation, the friendlier treatment of foreign capital and the economic stabilization program (The Real Plan) have together fostered the globalization process in the region and have stimulated different responses from large and small firms, all threatened by the new and tougher competitive environment.

Consolidation and multinationalization via mergers and acquisitions were consequences of those institutional changes. Most Brazilian companies were family owned by early 90's and were facing a difficult process of succession. Family disputes together with a stiffer market competition resulted in a wave of acquisitions in *sales rhythm*.

Mergers and acquisition in Brazil was leaded by food and beverage segment, according to KPMG data (Farina & Viegas, forthcoming), and profoundly affected the Brazilian agrifood system in the past decade, causing firms to make strategic changes in the organization of the supply chain, to increase co-ordination, reduce costs, and raise quality, with important effects on the upstream segments in the chain, such as the farmers.

#### *3.1 Overview of concentration in retailing*

Brazilian supermarket sector has rapidly become concentrated, as can be observed in Table 1. In 5 years the concentration ratio for the ten largest supermarkets has almost doubled. It is worth mentioning that the process was accelerated after monetary stabilisation (1994) and that mergers and acquisitions were the main route for concentration and denationalisation. Among the 10 largest supermarkets, 4 are multinationals and 1 has a partnership with a French company since 2000, while in 1994 all supermarkets except Carrefour were Brazilian family owned companies. Considering the 5 largest in 2001, they reach almost 40% of total sales!

Table 1 - Concentration of supermarket distribution and market share evolution, 1994-2001 (%)

<b>Supermarkets</b>	<b>1994</b>	<b>1996</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Pão de Açúcar (partnership with Casino since 1999)	6.5	7.4	12.9	14.1	13,6
Carrefour (French)	9.4	10.4	13.1	14.1	12,7
Bompreço (Dutch Royal Ahold – 2000)	2.4	2.6	4.4	4.5	4,4
Sonae (Portuguese)	-	-	4.7	4.4	4,7
Sendas	2.6	3.4	4.0	3.7	3,6
Wal-Mart (US)	-	-	1.6	1.8	2,0
Sé / Jeronimo Martins (Portuguese since 1999)	0.8	1.0	1.2	1.4	1,4
Cia Zaffari	0.9	1.3	1.1	1.1	1,2
C. Barbosa & Cia Ltda	0.5	0.6	0.8	0.9	1,0
Co-operativa de Consumo	-	-	0.8	0.8	0,9
10 largest	24.3	28.4	44.6	46.8	45,6

[www.abrasnet.org.br](http://www.abrasnet.org.br)

The Brazilian Competition System (similar to US Federal Trade Commission and DOJ-Antitrust Division) has increased their surveillance over supermarkets acquisitions and required partial divestitures or performance compromises to approve acquisitions. The main concern of Brazilian authorities is the impacts on consumer prices and with the increasing buying power of the supermarkets on suppliers.

Despite the acquisition wave, however, the number of stores has grown since the mid 90's, including the independent supermarkets and traditional retailers. Interestingly in the context of continued consolidation, the independents gained market share considering food sales only. Table 2 shows their food retail market share increasing from 40% to 44% while the chains' share stagnated at 45-43%. Of course, the concentration is high: less than 1% of the retailing stores are responsible for more than 42% of food sales! The concentration is growing within the chain segment – the ten largest chains have almost doubled their market share in food sales. That is, the merger and acquisitions wave has been concentrated among the largest companies and they have not succeeded to reduce the independents market share in food retailing.

The independents have concentrated on rural towns or areas in cities where the chains have not yet located; or if they are established where the chains have located, they have competed with them in prices or very high quality services. As Farina and Nunes (2002) have recently discovered, two phenomena must be considered. The entry of new international chains and the growth of the market led to a change in the pattern of competition in this segment. In addition to the intensification of price rivalry, the supermarkets invested in differentiation based on perishable products, and in the design and product lines of stores, to

serve different moments of purchase and clientele segmentation. As the market grew, it could even hold a greater number of independent supermarkets and redefined traditional stores. One of the consequences of the intensification of competition was the pressure on suppliers for prices and standards of quality of products and services.

The reaction of the segments upstream from retail was not only to unleash adjustments of cost and product, but also of development of collaborative relationships among large wholesale and small retail, large processors and small retail, and processors and suppliers, from the agricultural sector or industrial, in order to make their businesses mutually practicable. The large firm understands that it must be on the shelves of the large retail networks, but that this market has low margins or none at all. The gains must be made outside the large chains and shared with smaller firms to make the strategies feasible. This strategy deserves to be studied more carefully, but it certainly represents an important phenomenon in the development of the food agribusiness system (Farina, 2002:444-445)

Table 2: Food retailing by type of store, 1994-2000

Year	% No. of stores						
	1994	1995	1996	1997	1998	1999	2000
Traditionals	85.0	84.5	84.5	84.8	84.4	82.1	82.3
Independents	13.5	14.4	14.1	13.9	14.3	16.7	16.6
Chains	1.5	1.5	1.4	1.3	1.3	1.2	1.1
% 10 largest in chain	15.95	15.00	14.74	16.60	18.85	24.92	31.75
	No. of stores						
Traditionals	211965	227603	238671	257607	257822	262348	269438
Independents	33808	37933	39802	42121	43825	53196	54218
Chains	3735	3907	3961	3954	3888	3884	3536
10 largest	596	586	584	656	733	968	1123
Total Brazil	249508	269443	282435	303673	305534	319428	327192
	% of food sales						
Traditionals	14.9	15.3	15.6	15.4	15.6	13.7	13.2
Chains	45.1	44.4	44.6	44.9	46.6	44.7	42.8
Independents	40.0	40.3	39.8	39.7	37.8	41.6	44.0

Source: AC Nielsen – 1993/1994 to 1999/2000 (www.abrasnet.com.br).

Farina (2002:443)

Leading chains (a chain has 5 stores or more) adopt a pattern of competition based mainly on advertising and product promotions, while independent supermarkets (fewer than 5 stores) compete mainly in service and price. The

independents face an important mobility barrier (Caves and Porter, 1977) and earn lower margins, but they are a real option as a distribution channel.

### 3.2 Food processing

As already mentioned the wave of mergers and acquisitions was led by the food and beverage sector, raising concern among the Brazilian Competition Authorities. However, as in the retail segment, the number of food processors has grown 16% since the mid 90's, from 17.000 firms to 20.300. Considering food industry total shipments, the multinationals increased their market share from 19% in 1996 to 27% in 2000 (Annual Industrial Research – IBGE – [www.ibge.gov.br](http://www.ibge.gov.br)).

The processing industry is less concentrated than the modern retail segment and the concentration level has slightly grown since 1994. Table 3 shows that the concentration ratio for the ten largest companies is now 36%. However, mergers and acquisitions have increased and changed the competitive environment.

Table 3: Food industry concentration ratio CR<sub>10</sub>  
(10 largest companies' gross revenue/total food industry revenue)

	1994	1996	1999	2000	2001				
Nestlé <sup>a</sup>	5.42	Nestlé <sup>a</sup>	5.25	Nestlé <sup>a</sup>	6.04	Nestlé <sup>a</sup>	5.45	Bunge <sup>a</sup>	7.59
Copersucar	5.00	Copersucar	3.22	Ceval <sup>a</sup>	4.03	Bunge <sup>a</sup>	5.20	Nestlé <sup>a</sup>	6.03
Ceval	3.53	Ceval	2.70	Sadia	4.03	Sadia	3.69	Cargill <sup>a</sup>	4.78
Santista <sup>a</sup>	3.28	Santista <sup>a</sup>	2.45	Cargill <sup>a</sup>	3.91	Cargill <sup>a</sup>	3.52	Sadia	3.85
Sadia	2.89	Sadia	2.38	Perdigão	2.49	Perdigão	2.20	Copersucar	3.75
Frigobrás	1.68	Cargill <sup>a</sup>	1.92	Parmalat <sup>a</sup>	1.98	RMB <sup>a</sup>	1.68	Perdigão	2.99
RMB <sup>a</sup>	1.68	Perdigão	1.49	Santista <sup>a</sup>	1.98	Parmalat <sup>a</sup>	1.55	Unilever <sup>a,b</sup>	2.54
Perdigão	1.62	Parmalat <sup>a</sup>	1.47	Kraft Lacta <sup>a</sup>	1.33	Kraft Lacta <sup>a</sup>	1.09	Coamo	1.67
Yolat <sup>a</sup>	1.51	Sadia Frigobrás	1.43	Arisco <sup>a</sup>	1.31	Fleishmann <sup>a</sup>	1.08	Parmalat <sup>a</sup>	1.44
Cargill <sup>a</sup>	1.50	RMB <sup>a</sup>	1.29	Nabisco <sup>a</sup>	1.21	Aurora	0.87	Fleishmann <sup>a</sup>	1.24
Total (CR <sub>10</sub> )	28.08	Total	23.60	Total	28.28	Total	26.32	Total	35.89

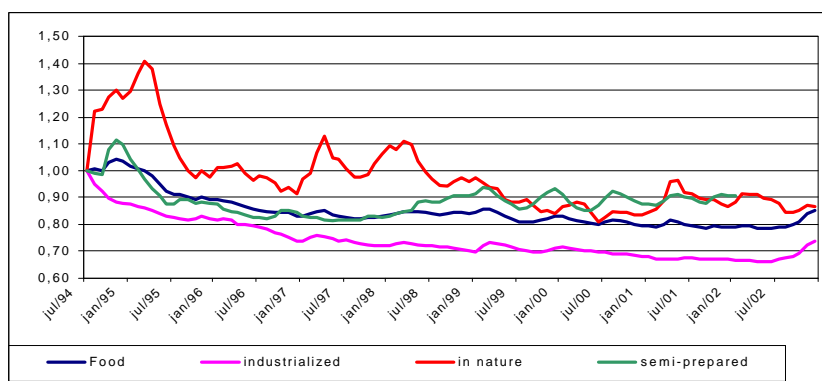
Source: Editora Abril (1995, 1997, 2000, 2001) and Brazilian Food Industry Association ([www.abia.com.br](http://www.abia.com.br)).

Note: a) Multinational.; b) Unilever bought Bestfoods that had bought RMB that had already bought Arisco

As in the retail sector, stiff competition has led to price and cost competition, market segmentation, and product differentiation, the upshot being that since 1994 food prices have declined by 30% on average, and processed food prices by 40%. The number of new processed products has grown: average yearly

product releases jumped by more than 200% from 1995/1997 to 1997/2000, as reported by the Brazilian Food Industry Association (ABIA). Therefore, the main concern of the Brazilian Competition Authorities regarding consumer prices has not been confirmed in the food segment, so far.

Graph 2 –Index of Food Real Prices in Greater São Paulo  
(deflated by Consumer Price Index – FIPE – basis jul/94=1,00 )



Source: FIPE - Fundação Instituto de Pesquisas Econômicas (Economic Research Institute Foundation) [www.fipe.com](http://www.fipe.com)

Farina and Nunes (2002) have discovered that the relative price between food industry and agricultural inputs has also declined, showing that the contribution to industrialized food price slump has come from the downstream segments of the chain – industry and distribution. Based on interviews, the authors show that the cost squeeze that allowed the consumer price reduction came from adjustments in logistics, procurement strategies, including outsourcing, higher labor productivity and the adoption of food quality programs in order to reduce industrial losses of raw material.

### 3.3 General effects on processors and farmers

Even for large food manufacturers/processing companies such as Nestlé, Unilever, Sadia, and Bunge, the bargaining power of the largest retailers has changed buyer-seller relationships and tightened suppliers' margins. However, processing companies cannot afford to have their products off retail shelves because of the crucial role of supermarkets in food retailing.

Supermarkets, food-service chains, and large processors demand and, because of their buying power, can require relatively high standards of quality and safety in the raw materials they buy from farmers. These requirements are reflected in stringent private grades and standards. For example, food-service franchises, especially the international chains such as McDonald's, are very demanding (much more so even than supermarkets) in terms of food safety and other quality attributes. They require from their suppliers control of water quality,

seeds variety, pesticides, packaging, and temperature, along with rigid standards of size, colour, and texture.

Retailers have changed their purchase systems as they have consolidated. Together with the processing industry, they have adopted new procurement cum logistics systems (such as distribution centres with modern logistics platforms) have drastically reduced the number of employees, have redefined the scope of operations focusing on core business activities, and have implemented quality control processes, which, in many cases, required the commitment of suppliers, including farmers. Upstream impacts were not limited to reduction in the number of suppliers and the absolute exclusion of producers, but also involved changes in the relationships between buyers and suppliers.

Among the main changes introduced by the larger retailers, multinational or domestic, is the use of huge distribution centres as focal points for product procurement – first introduced for non-perishable items, then extended into produce procurement, and now used for refrigerated items as well. As stated by a Brazilian wheat flour producer, ‘we live in the supermarket dictatorship era!’ (Lawrence Pih, president of Pacífico Mill, 2002). The consolidation of procurement means that the capacity of farmers and processors to meet the large retailers’ requirements (cost, volume, quality, safety, delivery timing, packing or packaging) would increasingly determine whether they stay in the market, if there were not a growing number of smaller retailers which, supported by large wholesalers and manufactures, have survived.

Finally, it is important to focus not just on the consolidation itself as an explanatory factor but also on the competition that leads to and follows consolidation – and the specific competitive strategies that firms adopt. Institutional changes such as deregulation of prices, the imposition of new public and private standards, trade liberalisation, and tougher environmental and consumer protection by the government have created a new environment where efficiency and innovation become the most important instruments of competition for retailers, processors, and farmers. The intensification of competition, started in the early 1990s, created the basis for further consolidation and multinationalisation that has gained momentum since 1994/5; the processes are mutually reinforcing – competition leads to consolidation which leads to more intense competition.

The dairy system case is an excellent example of the adoption of new regulating structures in a chain and the implications for small producers and shows more precisely the impact on numbers of suppliers, although it is not as rich in the variety of regulating structures adopted.



### *3.4 Effects On The Dairy Chain*

#### *3.4.1 Processing Consolidation And Multinationalisation,*

Brazilian dairy processing underwent consolidation and multinationalisation from the early 1980s through the 1990s. This was similar to what happened in retailing but the industry was already relatively concentrated in the early 1980s. In 1981, the top three (Nestlé and two domestic firms) had 52% of the market, In 1996, the top three (Nestlé, and Parmalat plus a domestic firm) had 61% of the market; and just Nestlé and Parmalat 53%. While Parmalat had only one-third the sales of Nestlé in 1996 in Brazil, it had entered Brazil only in 1988 but by 1994 had 11% and by 1996 13% of the market. Its meteoric rise was due to the acquisition of two dozen domestic firms between 1988 and 1997 (Jank et al., 1999a). After this rapid concentration, there was a slight de-concentration (unlikely to be a strong reversal of the consolidation trend) up to 2001, as the CR<sub>12</sub> fell from 52.6% to 41% of inspected milk processed (see Table 4).

Table 4 shows clearly that Nestlé and Parmalat dominate and drive the dairy sector. Five of the 12 firms in the table are multinationals; two are domestic firms in joint ventures with multinationals: Batavia, a former ‘central co-operative’, 51% owned by Parmalat, and Vigor, a Brazilian family-owned firm, in partnership with MD Foods, a Danish dairy company, for cheese production.

Before the 1990s, most of the main processing firms were strong central co-operatives (in order to capture economies of scale in processing, they collect from local co-operatives that collect milk from farmers and cool it) producing cheese, powdered milk, pasteurised milk, and so on. Deregulation of the dairy market occurred from 1989 to 1993; retail and farm prices were freed and imports were allowed. This brought a sharp increase in competition as firms then began competing vigorously in price and cost cutting. However, the central co-operatives could not meet the new competition, in particular the entry of the multinationals, and most of them struggled financially. The stabilisation policy plus the rise of supermarkets intensified the competition in the mid-1990s.

The result was that the regional and central co-ops were sold to the multinational companies listed in Table 4. Among the 12 largest companies, only Itambé, the third in volume of milk processed, is still a strong central co-operative. Paulista (still number 3 in 1996) has recently sold its brand name and some processing plants – the higher value added products - to the French Danone.

The new investments, deregulation, and new entries drove down prices (the relative prices of dairy products have dropped by 35% since 1994), and brought product differentiation and market segmentation. Supermarkets, in price competition with each other, passed on the lower milk prices to consumers. Consumer prices are lower, while from 1997 to 2001 milk production and processing have increased by 2.5% a year in volume. This suggests that the

production and efficiency gains throughout the dairy system have been passed on to the urban sector.

Moreover, the extremely rapid rise of UHT milk introduced an important new factor that increased competition and the importance of volume sales to supermarkets. Parmalat's introduction of UHT milk in the late 1980s and its outstanding growth (especially after 1992) caused this product to take over the fluid milk market. Tetrapak's (Sweden) aggressive strategy of sales all over the country of vacuum-packing equipment for UHT milk, along with an equally aggressive promotion of UHT milk by Parmalat, led to a rapid substitution of UHT for pasteurised milk: from 5% of the fluid milk formal-sector market (60% of all fluid milk nationally and around 85% in large urban areas) to 75% in 2001. UHT real prices have declined more than 40% since 1994.

The consequences of this substitution are important. Most UHT milk is sold in supermarkets, while pasteurised milk used to be sold by bakeries. This means that milk retail has shifted rapidly into supermarkets, whose relentless quest for cost-cutting was passed on to the dairy processors. Private standards were instituted by the leading processors to reduce costs by raising efficiency and providing incentives for investments by farmers. They required milk cooling at the farm level which reduces procurement costs and improves the quality of the raw material. The managerial and technological implications of the private standards for farmers were amazing.

#### *3.4.2 Impacts on dairy farms*

The above changes led to upheaval in the distribution of dairy production in Brazil in only a decade. First, they affected the regional distribution of milk production. UHT milk has broken regional barriers and production patterns as it can be transported long distances at low cost (no necessity to transport in refrigerated trucks, as for pasteurised milk). Poor quality and lack of controls led to pasteurised milk lasting about three days, making inter-regional commerce difficult. UHT milk, by contrast, has a shelf life of 3-6 months. UHT milk from Rio Grande Do Sul, Paraná, and Goiás states and even from Uruguay and Argentina is sold in São Paulo (the largest milk market) at competitive prices with milk produced in São Paulo. This trend was intensified by the regional and national sourcing systems of the large supermarket chains, such as the Carrefour distribution centre discussed above.

All this caused a rapid integration of Brazilian milk markets and increasing competition pressures. As a consequence, there has been a concentration of milk production in new regions with shipment all over the country, contributing to the demise of the traditional and less competitive regions, in particular of São Paulo and Minas Gerais, which had high production because of the natural environment, but also the large markets of São Paulo, Belo Horizonte and Rio de Janeiro. These regions now have higher costs due to competition for land

(from urban growth as well sugar and oranges) and from industry for labour. Companies, including co-operatives, built their UHT processing plants in the centre west such as the Goias state to enjoy lower costs and now have to compete in a national and regional market.

Second, there has been an effect on the producer co-operatives. As noted above, the central co-operatives used to dominate the pasteurised milk segment, and they have been the most affected by these changes. All co-operatives currently produce UHT, even very small ones with scale disadvantages. However, the pasteurised milk was mainly sold by co-ops that were protected from competition because, with pasteurised milk being more perishable and requiring cooling storage and transportation, they were able to dominate their local catchment area. Nestlé and Danone have never sold pasteurised milk.

Third, there were inter-farm distribution effects. Tough price competition has led to the adoption of new chain management strategies by processors. Reacting to the pressures of lower margins, leading processors required the adoption of refrigeration tanks at farm level, which requires a minimum scale of operations. Moreover, in order to take full advantage of this technology, the producer is stimulated to undertake a second milking, followed by mechanical milking, and improvements in genetics. To take full advantage of the refrigeration system, the farmer has to invest in herd and milking equipment, and the technological upgrade requires a managerial upgrade. Hence, the investments that arise from the cooling requirement are multiple.

In Brazil, the smallest tank holds 200 litres, requiring production of at least 100 litres a day. But average farm production is 50 litres a day, and most farms cannot manage the new system. Table 5 shows the distribution of dairy farms in Brazil in the latest census (1995); only 5.3% of dairy farmers had output/day of 100 litres or more, implying a potential massive exclusion of small dairy farmers from this technology.

**Table 5: Dairy farmer milk production distribution, 1995-6 (%)**

Region	Up to 50 l/day		> 50 < 100 l/day		> 100 < 200 l/day		> 200 l/day	
	a	b	a	b	a	b	a	b
Northern	90.9	54.3	6.4	22.7	2.1	14.3	0.6	8.7
Northeastern	95.9	53.8	2.5	15.0	1.1	17.7	0.5	13.5
Southeastern	73.1	21.1	13.3	17.0	8.2	20.6	5.4	41.3
Southern	92.9	57.1	4.8	17.7	1.6	11.8	0.7	13.4
Centre-west	72.6	28.2	15.8	23.6	8.2	23.7	3.4	24.5
Brazil	87.7	36.1	7.0	18.2	3.5	17.8	1.8	27.9

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Notes: a) Producers; b) production.

Source: Brazilian Institute of Geography and Statistics, *Censo Agropecuário*, 1995.

This is in fact what was observed. During the period 1997-2000, the number of farmers delivering milk to the top 12 companies dropped by 60,000 (35% of suppliers) and there was a 55% increase in their average size (litres/day/farm) (see Table 4). Nestlé alone shed 26,000 farmers from its supply list – a drop of 75% – and the average scale of a supplier has more than tripled. This phenomenon is not confined to private companies and multinationals. Itambé, the largest Brazilian dairy co-operative, has reduced its number of producers (by voluntary and forced exit) by more than 54%, while the average scale has grown by 167%.

The excluded small farmers moved to smaller processors, or to the informal sector, or went out of business. Only the next census in 2005 will tell the full story of small dairy farm sector.

However, the smaller farmers have gone in for collective tanks to meet the scale requirement, though the larger farmers will keep their advantage since they do not face the transaction costs involved in the collective use of physical assets (Jank et al., 1999a). Dairy companies and co-operatives have encouraged the use of collective tanks, especially in regions where the average dairy farm is smaller, such as in the centre west. They have also financed or facilitated credit for milk producers. The Brazilian National Development Bank offers a special line of credit at favourable interest rates to the ‘pro-leite’ programme. Large processors act as intermediate agents in the distribution of this credit to the farmers. However, the leading processors interviewed by the author report a diminishing number of these collective tanks because of conflicts among the farmers and the higher costs of managing these systems.

Fifth, the excluded farmers are not confined to small producers. The beef/milk producers or the beef producers who sell milk during the high season will also tend to disappear. Moreover, investment in milk refrigeration is specialised. The farmer therefore tends to become not only more efficient but also more sensitive to price variations. Refrigeration leads to other investments in milk production that are valuable only if milk and not beef is produced. It is thus worthwhile to invest only if there is specialisation, and this implies that the farmer will lose the flexibility to send his cows to slaughter when milk prices are low and also that he will have more cash expenses (and not only opportunity costs). Nowadays, many farmers do not hire workers but use family labour.

Moreover, this threatening competitive environment has led many large dairy farmers from the most traditional regions to change their business as well.

Highly specialised cattle herds have been auctioned and transferred to other regions that have increased their share in the country's milk supply.

The government is currently formulating and negotiating new legislation to regulate safety in dairy products, as part of a wider 'Milk Quality Improvement Programme'. The legislation is expected to make current private standards public, requiring refrigeration at farm level and refrigerated transport systems. This will generalise and accelerate the trends noted above. The current quality/safety levels for pasteurised milk will be replaced by two types of milk: for consumption in fluid form (pasteurised or UHT) or in processed form (cheese, powdered milk, yoghurt). New quality/safety tests will also be mandatory for processors, and will allow them to impose discounts or give price incentives to producers for quality.

#### 4. Conclusion

Three interlinked forces – consolidation, multinationalisation, and increased competition – have marked Brazilian food retailing (with the rapid rise of supermarkets), services, and processing over the past decade since liberalisation. Competition has occurred not only in the traditional realm of prices and costs, but also in quality and service and product differentiation.

The strong competition and the strategic changes it produced led to the adoption of new technologies – in processing, in retail logistics, in distribution, in farming, as illustrated in the case of dairy products. For instance, to meet the large processors' quality and volume requirements, dairy farmers needed to invest in first-class cold chains and large cooling tanks. Few farmers could afford this and there has therefore been a rapid reduction in the number of small farmers selling milk to large processors. Collective tanks turned out only to postpone this exclusion and exit as they were not as efficient (in logistics, traceability, group contracting) and managerially practicable as the larger tank system.

The main consequence for small farmers is an increasing need for better access to capital and education. Management capacity is almost as important as physical capital, and this is the most difficult thing to provide in Brazilian conditions. Collective action to deal with scale requirements is needed. However, collective action has to be designed to satisfy new product and process standards or to avoid exclusion from the new supply technology and distribution management, such as Efficient Consumer Response or electronic data exchange. Collective action through co-operatives or associations is important not only to be able to buy and sell at a better price, but is also vital to help smaller farmers adapt to new patterns – and much greater levels – of competition

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Table 4: 12 Largest Brazilian dairy companies by milk processed – 1997-2001

Companies	Annual milk reception (litres million)					No. Of milk suppliers					Production per day (litres/day/farmer)				
	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
Nestlé <sup>a</sup>	1413	1358	1336	1393	1425	35089	28920	22512	14142	8.536	110	129	163	270	457
Parmalat <sup>a</sup>	857	814	773	919	941	21040	16052	14302	15550	15.300	112	139	148	162	168
Itambé (co-op)	730	753	797	773	834	18250	15369	12690	8400	7.760	110	134	172	252	294
Elege (Doux) <sup>a</sup>	607	603	660	760	782	38537	34402	34402	32188	31.282	43	48	53	65	68
Paulista (co-op)	673	626	419	513	488	24481	22162	15154	8925	8191	75	77	76	157	163
Batavia (Parmalat) <sup>b</sup>	273	274	297	273	226	1125	1093	7772	7505	6820	67	72	105	100	91
Vigor Group (MD Foods) <sup>b</sup>	295	288	231	230	200	8142	6442	4823	3693	3924	99	122	131	170	139
Leite Líder	141	165	192	207	220	5880	6930	8650	8795	7035	66	65	61	64	86
Centroleite	132	151	141	175	220	3180	3355	3335	4205	4725	114	123	116	114	154
Latricínios Morrinhos	105	121	153	146	207	4300	4250	6677	7292	7299	67	78	63	55	78
Fleischmann Royal <sup>a</sup>	166	184	185	140	199	4000	3000	2640	2335	2372	114	168	192	164	230
Danone <sup>a</sup>	167	144	120	130	247	1426	1180	995	1420	2.452	321	335	330	251	276
Total	5560	5480	5303	5659	5501	175450	152455	133952	114450	97505	87	98	108	135	154
CR <sub>12</sub> – Formal market (%)	52.6	50.1	47.9	48.0	41,6										
CR <sub>12</sub> – Total market (%)	29.8	29.3	27.8	29.3	26,8										

Notes: a) Multinational companies; b) multinational participation in capital.

Source: www.terraviva.com.br.