GLOBALIZATION AND PORK RAISING IN MEXICO: THE CHALLENGES OF INTEGRATION TO THE WORLD MARKET*

María del Carmen Hernández M.
Centro de Investigación en Alimentación y Desarrollo

Carlos J. Maya A.
Universidad Autónoma de Sinaloa

INTRODUCTION

Mexico has experienced globalization a long time before this word became a cliche. Globalization deepened during the 1980s, when Mexico's import substitution model was replaced by the secondary exports model. Nowadays, there is no doubt that the Mexican economy is fully oriented towards exports, which account for one-third of its GDP. At the same time, the transition from one model to the other had major consequences. Among the most important of these were the disarticulation (Cypher 2001**)** and the polarization (Dussel 2000) of the Mexican economy, which means that export activities have not usually developed linkages with other economic sectors, but have functioned as a kind of modern enclave. This represents the exact opposite of other well-known and successful clusters, such as Silicon Valley in California. Polarization has occurred at several levels, among regions, economic sectors and producers, even within the same industry. That is also the case with agriculture *vis-a-vis* the rest of the economy, in sharp contrast to the manufacturing and finance sectors. Within particular economic sectors there are also deep and growing inequalities. This is the case within agriculture, between producers oriented towards the international markets and those oriented to the domestic markets; and between producers who are able to reach the level of investment dictated by the international competition and those who are crowded out of the market because of their lack of resources.

On the other hand, and as part of this transformation and restructuring process, there has occurred a redefinition of the roles of the countries that participate in the agricultural world market. Developed countries have come to focus on the production of strategic goods, like corn, eggs, meats, milk (Rubio 1995: 34), whereas underdeveloped countries produce for niche markets, and have come to specialize in the production of luxury or supplementary agricultural goods. Given these trends, there is considerable interest in the analysis of the pork industry in Sonora, in northwest Mexico. Ever since they first entered the international market, producers in this region have experienced a very dynamic and contradictory process of development and a concentration of output. In order to be competitive, pork producers in Sonora have had to seek market niches that were of no interest to the biggest producers of the industry, located in the USA, Canada and Denmark. Therefore, producers in Sonora focused on the specialties market, which in this case means portioned pork meat, which is cut exactly as the customer specifies. Such products include pork meat cuts portioned to a specified weight and individually frozen; for example, sliced loin; belly chunk; diced pork ham meat; pork shoulder slices; pork shoulder sticks, and many other products. Although this market is very small, it includes customers with high incomes, who willingly pay a premium price for a product which satisfies their contractual requirements.

This kind of insertion into the world market has allowed Sonora's pork raisers to revitalize their activity, in spite of a cyclical crisis which has affected all the economic sectors, and in spite of the drastic reduction of government support to the agricultural sector. In focusing on international markets, the pork raisers adopted a strategy of organizing themselves into trading companies, which proved to be very successful. However, this kind of embedding into the world market involved some other problems, such as polarization and the crowding out of some producers from the market, as well as the disarticulation of the sector from the local economy.

Understanding the positive and negative aspects of this experience could help us to analyze the most effective ways for Mexican producers to position themselves in international markets, and to consider also what action might be necessary in order to counteract some of the negative effects of the secondary exports model. In particular, it should be stressed that at the macroeconomic level, the promotion of regional activities like the pork industry in Sonora could help to reduce the strong concentration of Mexican exports, which are currently strongly concentrated on a few regions, a few industries and even fewer

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* María del Carmen Hernández M. is a Researcher at the Centro de Investigación en Alimentación y Desarrollo. Carlos J. Maya A. is Research Professor at the Universidad Autónoma Sinaloa, México. The authors gratefully acknowledge financial support from the Sistema de Investigación del Mar de Cortés (SIMAC), which made this research possible. A part of this project was included in the FAO Strategists Alliance for Rural Development Program (AC/00163 FAO). The authors would also like to thank Ing. Antonio Ulloa Méndez, and the managers of the firms who agreed to be interviewed.

big companies. Similarly, it is desirable to promote activities which could develop productive linkages which have positive spillover effects at the regional and the local level.

THE STRUCTURE AND ORGANIZATION OF THE INDUSTRY

Sonora´s pork industry was established at the end of the 1950s. It expanded rapidly during the 1960s as a consequence of the 'green revolution' in wheat, which made possible a 100 percent increase in the wheat harvest. This, together with financial support from the government, allowed farmers in the region to expand their activities into poultry and then into the pork industry. During the 1980s, these pork producers were already the main suppliers of pork meat and live hogs to the Mexican markets located in the centre of the country. They were independent growers, whose inventories of live hogs ranged from 50 to 400 sows. In order to buy inputs and sell outputs collectively, growers were organized in four marketing companies, an organizational form which was initially very attractive to the small and medium producers.

The growth of Sonora´s pork industry was interrupted in the 1980s as a consequence of the stabilization program implemented by the Mexican government and by a severe contraction of the domestic market (Dussel 2000). Other adverse factors included increasing production costs and competition from other regions of the country. As a result, local production of pork fell from 156,285 tons in 1984 to 110,191 tons in 1990. Under these circumstances the pork producers began to search for alternative markets and to adopt new competitive strategies (which are discussed later). Of particular significance in this context were the opportunities made possible by the liberalization of trade between Mexico and the United States even before the North American Free Trade Agreement (NAFTA) was introduced in 1994. Such developments also contributed to further structural changes within the industry, in particular increased concentration of ownership. In 1982, the Unión Ganadera Regional de Porcicultores del Estado de Sonora (Sonora Pork Producers Association) had 169 members. Seventeen years later this number had fallen by 29.5 percent. The average swine farm in Sonora had 470 sows in 1997, but just two years later, some pork producers had more than 15,000 sows (Fideicomisos Instituidos en Relacion con la Agricultura (FIRA) 1997; Union Ganadera Regional de Sonora 1999). As will be seen shortly, this concentration of ownership at the farm level was matched by an increasing degree of corporate control as large companies invested in these facilities or entered into joint ventures. All of these developments help us understand why the pork industry is currently the most successful activity within Sonora´s livestock sector.

The Embedding Context

Clearly, the Mexican pork industry has experienced major changes over the last twenty years, promoted by internal as well as by external factors. In terms of the internal factors, the most relevant has been Mexico's recurring economic crises, which have forced a reduction in the consumption of red meat, as a consequence of successive reductions in the minimum wage.[1] These crises have also raised the costs of production, through inflation and higher interest rates,[2] while other adverse elements include the reductions in subsidies, and higher prices for electricity and other inputs.

Although the 1980s were critical years for the pork industry everywhere, there is evidence which supports the contention that the crisis in the Mexican industry was particularly severe (Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentacion (SAGARPA) 2000).[3] Although the industry slowly recovered over the 1990s, output has still not been restored to the production levels of 1982-1983. This is probably a consequence of the opening up of the domestic market to imports in 1988, when pork meat products began freely to enter Mexico.[4] Consequently, the relative share of the imports in the total pork meat supply doubled in the following year (Pérez 1996: 399). This trend continued until 1994, when imports accounted for 30.4 per cent of the total national supply (Secretaria de Agricultura, Ganaderia y Desarrollo Rural (SAGAR) 1998). The Mexican financial crisis of 1994-1995[5] resulted in a slight decrease in imports over the next two years, but these recovered during the

[1] Chicken meat has been substituted for red meats. This happened for two reasons, the first economic and the second cultural. In 1994, chicken prices fluctuated between $7.37 and $12.88 per kilogram (in Mexican pesos), whereas red meat cost $16.87 per kilogram and pork meat $17.94 per kilogram. At the same time, consumers began to express a preference for foods with lower cholesterol levels.

[2] Between 1975 and 1988, the average inflation annual rate was 55.2 percent. In some years of course, it was even higher (e.g. it was 159.2 per cent in 1987). To the increase in prices must be added the negative impact of higher costs of government services and products associated with the strategy of economic adjustment (www.banxico.org.2000).

[3] Open carcass production fell by 41.9 percent in the period 1980-1989, while live hog production fell by 36.9 percent. The decline in output for Sonora was 12.5 percent and 8.01 percent respectively.

[4] As noted earlier, although NAFTA came into effect in 1994, some of Mexico's sectors, like agriculture, experienced the opening-up of trade some years earlier.

[5] The Mexican crisis of 1994-1995 was in fact a structural crisis, although it manifested itself as a financial crisis (Dussel 1996; Ros 1995; Guillén 1997; Guillén 2000). It should be remembered that in December 1994, the Mexican peso collapsed and within a few months, had been devalued by more than 100 percent. The macro indicators for 1995 were very poor, and indicated a negative growth rate of –6.9 percent; inflation was running at 52 percent and the current account deficit amounted to 8 percent of the GDP. The overvaluation of the currency (of between 25 and 40 percent), a very large current account deficit financed by massive (porfolio) foreign investments, low productivity, declining private savings, questionable credit policies and mismanagement of debt, and the enormous issuing of dollar-linked short-term debt (*tesobonos*), were important factors underpinning the crisis. But in essence, the crisis expressed the failure of the anti-inflationary program

Asian crisis of 1997, when declining sales to Asia resulted in American companies raising their sales of pork meat to Mexico by 700 per cent. Between 1995 and 2000, Mexico became the second most important market for US pork, with 20 per cent of American exports going to Mexico (www.fas.usda.gov). At the same time, the share of pork in total Mexican meat production decreased from 28.2 to 24.8 per cent (SAGAR 1998: 27).

Mexican pork raisers faced not just the contraction of the domestic market, but also massive imports of foreign pork meat, which was usually produced under more favourable conditions. These imports were cheaper than the Mexican product, which depressed the domestic price and also reduced profit margins. All these factors gave added pressure to the competition among pork companies, and forced them to adopt development strategies to survive in a situation in which there were no more government supports.

Under these circumstances, the location of the Sonora pork industry - so close to the US, one of the main producers of pork meat, yet so far from the most important domestic markets for this commodity - has given rise to a very critical situation for this industry. Nevertheless, the pork industry is currently experiencing considerable success, despite the pressures which followed the freeing up of trade. The following data confirm this:

1. Between 1990 and 1998 the rate of growth of production volumes in Sonora´s pork industry was 5.3 percent, higher than the national average (2.68 percent), and the highest of all meat-industries located in Sonora.[6]

2. The local industry increased its share in the value added to industry end-products from 35 to 49 per cent (Gobierno del Estado de Sonora (GES) 1999).

3. Sonora's pork companies raised their share in the domestic supply from 10 to 18 per cent between 1990-98[7] (SAGAR 1998; SAGARPA 2000) and in 1996 supplied 90 percent of Mexican pork meat exports (Díaz n.d.).

4. Sonora's pork industry has not only restored output to the levels prevailing before the crisis of the mid-1980s, but could surpass these levels in the future. Exports have grown continuously, in spite of high corn prices in 1996, a financial crisis in 1994 (involving higher rates of interest and more expensive US dollar credits), and the oversupply of pork meat in the world market in 1998, which derived from a contraction of the Asian market and overproduction in the USA.[8]

The success of the pork industry in Sonora is the result of a number of initiatives, which were designed to provide a competitive edge in export markets. These initiatives are discussed in the next section of this paper.

COMPETITIVE STRATEGIES TOWARDS GLOBALIZATION

Given the handicaps they face with regard to geographical location and weather conditions,[9] the strategy of Sonora's pork companies had traditionally been to keep pace with current technological innovations and to be at the forefront in terms of the integration of production.[10] Such innovations are necessary in the face of the advances of their main competitors in Mexico, namely pork farmers from the Bajío.[11] Moreover, the opening of the Mexican-American border forced Sonora's pork companies to adopt new initiatives in the face of the threat from the American pork industry. Thus, they implemented the following strategies.

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that had the nominal exchange rate as the fundamental anchor (Edwards and Naím 1997), and most importantly, the subordination of the productive economy to the speculative economy during the preceding six years.

[6] For the same period, cattle production nationally grew by 2.4 percent, while in Sonora it declined by 0.23 percent; for poultry, production increased nationally by 8.77 percent but declined by 15.6 percent in Sonora (SAGAR 1998; SAGARPA 2000).

[7] The cause of this trend was that the local pork industry grew at a very high rate, whereas the production of the national pork industry plummeted.

[8] After the elimination in 1984 of subsidies to corn used by cattle breeders, the organized producers from Sonora began to buy corn on the international market, taking advantage of the financial facilities offered by the American and Canadian governments, and involving interest rates that were considerably lower than domestic rates. However, the peso devaluation in 1994 caused such debts to increase by 124 percent when expressed in Mexican currency.

[9] The weather in Sonora confers both costs and benefits; the extreme temperatures make necessary the use of air conditioning equipment, which increases fixed costs. However, at the same time, the dry environment helps the producer in dealing with sanitary problems, thereby reducing costs.

[10] The local producers process the feed they use and also buy corn through their producer associations. In addition, 70 percent of them are associated with some authorized slaughterhouses and many participate in companies like seedstock producers, and laboratories and firms which analyze feed rations.

[11] The Bajío region enjoys significant advantages, such as local grain production (sorghum), closeness to the consumer markets and the highest incomes per unit, which are $1,952 yearly per swine, 32 percent higher than in Sonora. Its disadvantages are related to sanitary issues (FIRA 1997:28).

1. Seeking new foreign markets. Even though Sonora's producers had some earlier experience of exporting through companies like Mezquital del Oro and Grupo PISA, which in the 1970s periodically marketed their products in Japan,[12] it was the opening-up of agricultural trade before the NAFTA that triggered new export activity. The first applications for export licenses occurred in 1988 and two years later Sonora's companies began to sell in Japan. The entry into the Japanese market was made possible by the fact that these companies operated at high levels of sanitary quality, acceptable technological development, and very efficient marketing. Thus, in 1992, they exported 5,400 tons of portioned pork meat to Japan, with a value of US$25.1 million. Four years later, export volumes reached 16,253 tons valued at US$76.1 million. This achievement, involving a growth rate of 338 percent in 1995, was without precedent, and placed this sector the third highest in terms of Mexican exports to Japan (Díaz n.d.:11)**.** Ninety per cent of these sales were attributable to companies from Sonora, which in the year 2000, exported 31,000 tons of pork meat valued at US$120 million (GES 2000).

In view of the fluctuations in demand in the international market, and their vulnerable position within this market, Sonora's pork companies decided, as a part of their marketing strategy, to pay greater attention to their presence in the domestic market.[13] In 1998, 70 percent of pork meat production was sent to Mexico City, and the States of Mexico, Chihuahua, Nuevo León, Sinaloa, Puebla, Coahuila, Jalisco, Baja California and Colima, while only 18 percent of production, consisting mainly of special cuts, was sold in the world market, mostly Japan, Greece and the USA.

2. Identifying the market segments where they could be competitive. Given the huge inequalities between the pork industries of Mexico and the USA, this strategy meant avoiding competition with the big American producers.[14] As a consequence, Sonora's pork producers did not enter into the fresh meat or the commodities market, but focused instead on a range of high value added products, namely special cuts - portioned, sliced, dressed or frozen products - specified by the buyer. All of this required the use of more advanced technology and a good deal of highly qualified labor.

3. Transforming the productive process on the farms and the organization of the marketing companies. In order to compete in the international market, Sonora's pork producers needed to modify their internal organization and structure. Before the recent move into new export markets, the marketing companies had limited their activities to selling pigs, but subsequently the aim was to meet international standards for production and productivity. At the same time, as a result of increasing fuel prices, transport costs for live hogs increased significantly, competition from other Mexican pork producers intensified and Sonora producers decided to set up their own slaughter plants. Initially, these were used to supply open carcasses to the Mexican sausage industries, although very soon foreign suppliers of open carcasses appeared, causing an oversupply and price reductions of up to 30 percent (Anonymous 2001a)**.** Under these circumstances Sonora´s pork producers recognized the need to differentiate their supply and also look for more attractive markets. Product diversification is the most important strategy for the leading firms, which undertake a steady process of enlarging their lines of production. Currently, these companies offer 58 products classified in three groups: fresh and frozen pork cuts; portioned pork cuts, produced in measured weights and separately frozen; and processed 'ready to eat' products. Of less relevance is the trading of sausage and secondary meat cuts. In order to continue with this overall strategy of product diversification, some companies have established a specialist department focussing on new products, the function of which is to identify buyer preferences and the possibilities of developing products with more added value, suitable for the demands of this select market segment. The internal organization of the processing plant is very flexible, so that it can quickly be adapted to meet the product specifications defined by the clients.

Accordingly, with this strategy, Sonora´s pork producers have necessarily intensified the industrialization of their products, in order to add more value through special cuts, packing and freezing. This has also required the employment of a large and highly qualified labour force. In order to meet international standards of production, productivity, health and biosecurity measures, the producers have organized their activities according to the development cycles and the gender of the livestock. In this way, they have been able to increase productivity, optimize their use of inputs (e.g. feed), and prevent diseases, through the use of improved pig breeds, the automation of processes such as feeding and cleaning, and the introduction of artificial insemination. These measures have made possible reduced production times, increases in the weight of animals, and a reduction in the average loin fat of live hogs, from 26.23 percent in 1994 to 20.33 percent in 2000 (Anonymous 2000). Special attention has been given to biosecurity measures, which comprise several processes (e. g. isolation of the farms, the handling of residues, controlled human and animal access, etc). Overall, such developments have transformed the marketing companies into industrial plants, and have significantly increased the efficiency of Sonora´s pork producers, who in 1997 had just 8 percent of the national inventory of live hogs, but supplied 18 percent of the Mexican pork meat production (SAGAR 2000: 16).

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[12] These activities were sporadic because producers needed an export licence, which depended upon supply conditions and prices in the Japanese domestic market. Under these circumstances, producers could not always arrive at an accommodation on supply with Japanese companies.

[13] The vulnerability of the Sonora's pork producers also stemmed from their marginal participation in the Japanese market. In 1997, Japan imported 700,000 tons of pork meat, of which Sonora´s pork producers supplied just 25,000 tons (Trueba 1998:4-14 and SAGAR 1999).

[14] In the USA there are companies with plants which slaughter 70,000 hogs a day. In Mexico, the biggest producers cannot slaughter more than 2,000 hogs a day (Anonymous, 2001a).

4. Deepening the process of the integration of production and relocating some companies. The strategy of the integration of the plant seeks to ensure a timely supply of meat of the high quality demanded. Hence, the leading companies supervise the whole production process, including the production of the balanced feed used by their associates and suppliers; the management of breeding farms and trading ('full cycle') farms; the operation of slaughtering plants and the processing of meat; and, of course, the marketing of the products. These companies pay special attention to the proportion of dorsal fat of the animals and also to their muscular symmetry, in order to facilitate more homogeneous cuts.

The point of this strategy is not just to reduce the costs of production, but to guarantee the timely supply of inputs while simultaneously satisfying the sanitary requirements demanded by consumers. Certainly in the 1980s, the integration of production was squarely aimed at cost reductions, which explains the emergence of associations for selling, slaughtering, and the production of feeds. Ten years later however, Sonora´s pork producers, already fully integrated into the world markets, largely pursue quality improvements in their products, linking several phases of the value chain of meat production; genetics, nutrition, sanitary control, processes of adding value, and marketing.[15] All of this requires huge investments in several fields (e.g. R&D, specialized equipment, personnel training, etc.), with the aim of ensuring the production of pigs which completely satisfy the Japanese demand for high and consistent quality.

5. No expansion of exports, but increases in the added value of the special cuts. This requires a level of technology and training that is not available to all companies; hence entry to this market segment is still very difficult for most export companies. At the same time, such commitments are unavoidable. A very precise knowledge of the market, and the establishment of very close relations with the customers, are necessary in order to satisfy the quality levels and the specific features demanded by buyers willing to pay high prices. This strategy is closely related to the production capacity of the Sonora pork industry, and its focus on two segments of the market; minimally-processed commodities and special cuts. The first segment includes ordinary pork meat, which does not require further processing or specific features. The second segment, in contrast, comprises very sophisticated cuts which require extensive processing. Profits in the first of these segments depend on high levels of turnover, and in the second segment on a firms' capacity to diversify its production in order to satisfy the needs of buyers. In addition, the availability of a highly qualified labour force is crucial, because it plays a key role in adding value, since many activities require craft-like skills. These specialized workers must be trained under tight sanitary conditions, in different departments and sections of the production plants, over a period of several months. Each new product requires new and specific learning processes, usually carried out under the direct supervision of the Japanese client, who sends an expert from Japan for this purpose. This expert remains in Sonora for weeks and even months, until the product requirements demanded by the client are fully met.[16] At that point, the Japanese buyer certifies the new product, which precludes the selling of this product to another client.[17]

All these measures are necessary if the Mexican firms wish to preserve their position in the international market. Besides, exports represent high profits for the studied companies. For instance, the third biggest Sonora´s firm exports just 18 percent of its output, but these sellings account for 50 percent of its total income.[18] This market is also attractive, because these kind of products have hardly any substitutes. Thus, their demand is not affected when powerful global players, like Denmark, channel massive supplies of pork meat products to Japan. Nevertheless, in spite of all these advantages, it is not easy for the Sonora´s pork producers to position themselves in these niche markets, for two reasons. First, on the production side, huge investments in equipment and labour are unavoidable. Second, on the demand side, the Japanese client - clearly the dominant partner in the relationship - requests special cuts as well as minimally-processed commodities. Therefore, the Japanese clients are demanding two different sets of products, each of them of different quality and therefore corresponding to two markets segments. Both of them must be supplied together and their combination constitutes what is called a *blend.* It is worth noting that the whole negotiations between the companies and their Japanese clients turn on the exact composition of the *blend.* Negotiations are unavoidable, since special cuts are very labour intensive products and therefore are more expensive than minimally-processed commodities, and blend prices must reflect this fact.

Therefore, Sonora´s pork producers aim at acquiring a higher level of expertise, better knowledge of the Japanese market, and adequate technology for special cuts production, thereby adding more value to their products; in this context, the aim of

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[15] Some firms, like Newsham, a member of the Norson group, are associated with US firms which employ Mexican workers to produce semen in the USA for farms located in Sonora. The same activity is being carried out by another firm, Kowi, which is associated with the Canadian firm Genetipork, which owns the company Geneti-Kowi, located in Canada. It supplies semen and other inputs to the Geni-Kowi company located in Sonora.

[16] An example of such specifications can be found in the Internet site of Alpro-Norson: 'Pork loin eye is prepared from main cut of loin. Side muscle on, 2.5 cm. belly side on from side muscle. Uniform 5 mm. fat covering over back area. Completely free of sinew and soft bone. One piece per bag, four bags per box' (source: http://www.norson.net/index2.html, March, 2002 .

[17] The price difference between ordinary pork meat (called full set) and special cuts makes profitable all these efforts. A kilogram of full set meat costs between US$2.50 and US$4.50, whilst the price of the special cuts fluctuates between US$5.00 and US$10.00 (Anonymous 2001a).

[18] Interview with the general director of the third most important processing firm in Sonora, August 2, 2001.

increasing export volumes is a secondary consideration. Several companies also indicated an interest in further extending their presence to other phases of the pork meat chain; this is certainly the position of the pioneers of the industry, such as Alpro-Norson, Kowi, SASA and Lancer, as well as the new companies such as Genpro, Cortes y Procesos de Carnes de Sonora Grupo Soles and Grupo Parada.[19]

6. Joint Venture Agreements with foreign companies. Such joint ventures make easier the capitalization of Mexican companies and allows them to enter into new lines of production, the products of which will have more added value. Joint ventures also help to open new markets using a well-known trade mark and to reinforce the strength of key production areas of the company.

In the mid-1990s, international competition forced Sonora´s pork companies to look for strategic alliances with foreign firms. Alpro-Norson became associated with Smithfield Foods Inc. in order to increase meat production, the processing of special cuts and to promote the marketing of pre-cook and ready-to-eat products.[20] Although Smithfield currently owns 50 percent of the shares of Alpro-Norson, the president and the vice-president of the company are Mexican nationals, and they remain in control of the marketing of special cuts exported to Japan.

For its part, Grupo Kowi has two agreements with American firms; the first is with Farmland to produce feed, involving an investment of US$3.4 million ((hppt:www.sonora.gob.mx/csocial/mes/1098/109801.htm); the second is with Geneti Pork International, a Canadian firm, for semen production in Canada (Anonymous 2000b). Many other companies in Sonora are also looking for such agreements with foreign partners as a way of improving their growth and consolidation.

CONCLUSION

Sonora´s pork industry has successfully faced the challenges of the international market, as well as the crisis of the Mexican economy. Furthermore, the rising level of imports of pork meat products into the Mexican domestic market have had no effect on the industry in Sonora. The integration of the industry into the world market required deep transformations, such that pork production can no longer be seen simply as an activity within Mexico's primary sector, but as part of a global agri-industrial chain. In this context, a major role was played by the four former marketing companies, which were established in the 1970´s and 1980s by small and medium growers in order to transport and sell their products collectively. These firms eventually were transformed into processing plants, which came to organize and integrate the whole of local production in order to satisfy the requirements of overseas, and particularly Japanese, demand. Thanks to the strategies adopted by these firms, Sonora´s pork industry is the most important of all local livestock activities, and contributes 50 percent of the value produced in this sector (*El Imparcial,* March 17, 2002).

However, this trend is not free from contradictions or negative consequences. Small and medium producers with insufficient financial resources have been removed from the market. Furthermore, in their effort to add value to their products, the companies in Sonora can source their main input, pork meat, from wherever the market conditions (relating to quality and price) are most favourable. In fact, between 1998 and 2001 the rate of growth of pork meat imports to Sonora was 39 percent, whilst for the same period the growth rate of exports was 8 percent (Secretaría de Fomento Ganadero 2002). Clearly, such behaviour could damage those local farms dedicated only to swine-raising.

In sum, the last ten years have seen Sonora's pork companies undergo a very intensive learning process, involving not just undertaking innovations in their production methods in order to meet the demands of the international market, but also learning to negotiate with all the economic agents who participate in their market niche; investors, customers, government officials, etc. The most important lesson is that while these companies are defined as pork processing and marketing companies, the origin of their raw materials inputs becomes irrelevant, provided they fulfill the sanitary and quality requirements. Certainly this principle makes more dynamic the way these companies function, but at the same time it jeopardizes the productive linkages of the whole of Sonora's pork industry.

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[19] This trend is confirmed by the official data. See SAGAR 2000 and the Sonora newspaper, *El Imparcial,* March 17, 2001.

[20] This joint venture has led to the establishment of 34 new swine farms, and an increase in processing capacity for special cuts from 1,000 to 2,000 pigs a day. This project will require an investment of US$61.1 million. See *El Imparcial,* September 17, 2002.

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