Tropical and Subtropical Agroecosystems, 12 (2010): 167 - 174

Tropical and Subtropical Agroecosystems

SHORT NOTE [NOTA CORTA]

PRODUCTION AND MARKETING CHARACTERISTICS OF PIG PRODUCTION IN THE SOUTH OF THE STATE OF MEXICO

[CARACTERÍSTICAS PRODUCTIVAS Y DE MERCADEO DE LA PRODUCCIÓN PORCINA EN EL SUR DEL ESTADO DE MÉXICO]

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SUMMARY

The paper examines the structure and the operation of pig production in the south of the state of Mexico, it explores the various stages that make up the commercialization process of the activity and the different actors involved, it means, all the process that is followed since the departure of the animal from the farm until its arrival as a final product for the consumer. It is also calculated the marketing margins resulting during the different stages of the process, which are used as indicators of profitability. The study was held in 2007 when a total of 17 producers of pork, two collectors, 28 retailers and 37 consumers of pig meat were polled. The objective of the survey was to gather information about the production process, actors, marketing costs and prices, and then determine the margins of marketing and characterization of pig production in the South of the state of Mexico. The results showed that at current prices, the producers participation in the final price, paid by the consumer, was 26,22 %, while the intermediaries participation was 73,78 %. The total marketing margin averaged 23,93 $/kg, from which retailers gained 23,52 $/kg (98,28 %), while the remaining 0,40 $/kg was for the collectors. The traditional marketing process used in the region is: producer, collector, retailer and final consumer.

Key words: Marketing; marketing margin; pig production.

RESUMEN

El trabajo analiza la estructura productiva de la porcicultura en el sur del estado de México; se estudian las distintas etapas que conforman el proceso de comercialización de dicha actividad y los diferentes agentes participantes, desde la salida del producto de la finca hasta su llegada al consumidor final. Asimismo, se calculan los márgenes de comercialización resultantes durante las diferentes etapas del proceso, los cuales son empleados como indicadores de rentabilidad. El estudio está referido al año de 2007, durante el cual se encuestó a un total de 17 productores de cerdo, dos acopiadores, 28 detallistas y 37 consumidores de carne de cerdo. La intención de las encuestas consistió en recabar información referente al proceso de producción, agentes participantes, costos de comercialización y precios, para posteriormente determinar los márgenes de comercialización y la caracterización de la producción porcícola en la región sur del estado de México. Los resultados mostraron que a precios corrientes, la participación del productor en el precio final, pagado por el consumidor, fue del 26.22 %, mientras que el de los intermediarios fue del 73.78 %. El margen de comercialización total promedio fue de 23.93 $/kg, del cual los detallistas obtuvieron 23.52 $/kg (98.28 %), mientras el restante 0.40 $/kg fue para los acopiadores. El canal de comercialización tradicional empleado en la región es: productor, acopiador, detallista y consumidor final.

Palabras clave: Comercialización; margen de comercialización; porcicultura.

INTRODUCTION

In Mexico, pig production ranks the third place in importance by its contribution to the total production of meat, although its contribution to the GNP (Gross National Product) is not relevant, its importance resides in the fact that this industry provides an important product set in the daily diet of the low class

population, due to the fact that it uses (in a direct way) a huge agricultural land; as a result, a wide and complex productive chain is developed; it includes the oilseed and fodder grain production, the elaboration of balanced foods, medicine, biological products, and the operation of establishments to sacrifice, to cut into joins and to industrialize the meat.

Despite the significant development reached by the Mexican pig production in the last 20 years, its fundamental characteristics continue being its enormous productive heterogeneity, its dependency on the outside to obtain breeding and nutritional consumptions (between 30 and 40 % of the sorghum and more of 80 % of soya is imported) and the lack of an internal quantification of their environmental costs (Pérez, 1999).

Thus, there is a great variety of productive systems in the country and they are different from each other because of the level of applied technology, the vertical and horizontal level of integration and their markets, which according to its main characteristics are grouped in three categories: technological, semi technological and extensive or self-supplying.

The technological sector includes 46 % of the herd, semi technological 20 % and the extensive one a 34 % of the pig inventory; in the first one 55 % of the production of pig meat takes place; in the second the 20 % , and the rest, that does not enter into the formal circuits of commercialization, is related to the extensive one (Pérez, 1999). As it has happened in other branches of the economic activity, in the pig production the crises has caused a strong concentration of the production

The state of Mexico is not exempted from this economic problem in the pig production activity, this is because the cattle sector is developed mainly in an intensive and extensive way; the intensive way is determined by the equipment dedicated to this aim and it is identified with the units of production like farms, stables, properties and ranches, whereas the extensive use depends on the natural species from each region like the gramineous and the leguminous mainly; these conditions occur in the southwest of the state where the fatten of cattle by browsing the fields, is the main economic entrance to the region, whereas the pig production activity is developed in an extensive way, representing an additional entrance and of very important sustenance for the families.

This way, in Tejupilco municipality, as well as in the municipalities from Amatepec, San Simón de Guerrero, Temascaltepec, Tlatlaya and Luvianos, that conform the District of Rural Development (DRD) number six, agriculture is the most important activity when using 93.586 ha, from this land a 56 % is destined to the agricultural production occupying a total of 52.775 ha, having as main crops maize, kidney bean, avocado and peach trees; a 38 % is destined to the livestock production (with a total of 28.055 it ha), bovine, pig, goat, ovine cattle and birds; the logging represents a 2 % and it occupies a total of 1.618 ha; the rest is used for other activities (SAGARPA-Delegation of the State of Mexico, 2006). In this sense, the present study is referred to the municipalities from Tejupilco and Luvianos, which altogether contribute with a 25 % of the pig production in the DRD.

Although in Mexico the social sector of the production, is integrated by common land people and joint owners, it is very important, the specialized pig production which is concentrated in the private sector, which holds 94 % of the herd in units of production of more than thousand heads (Pérez, 1999), reason why it is important to study the problem of commercialization in the semi specialized and clandestine production systems, which represent an important source of entrance and sustenance for the families of limited resources.

Objectives

The present paper introduces the objectives below: general objective: to analyze the productive structure and the marketing process in the pig production in the south of the State of Mexico, specifically in the municipalities from Tejupilco and Luvianos. Specific objectives: 1) to recognize the main characteristics of the pig production systems in the south of the State of Mexico and 2) to identify the main characteristics in the process of the pig production marketing in the south of the State of Mexico; to identify the main actors as well as to determine the marketing margins resulting from the whole process.

MATERIAL AND METHODS

The present work refers to 2007, when the field information was successfully obtained; a random unrestricted sampling was done, in which if a size of sample n is selected from a population of size N in such a way that each possible sample of size n has the same probability of being selected (Scheaffer *et al*., 1996); this way, 17 producers of pig, two collectors, 28 retailers and 37 consumers of pig meat were polled. The intention of the survey consisted on the successfully obtaining information referring to the production process, participant agents, costs of commercialization and prices, to later determine the margins of commercialization and the characterization of the pig production in the south region of the state of Mexico.

Systems of calculation

According to García *et al.* (1990) to calculate the commercialization margins there are two systems: the direct and the indirect one; the system that has demonstrated greater efficiency is the direct one and it consists on: a) to follow portions of agricultural products since they leave the operation until they arrive at the consumer, this will provide representative information of the phenomenon to study, b) to take note from the different costs and prices that take place during the different agents and c) to limit the investigation to representative agricultural product portions in movement, using statistical sampling to select the camp to study. All of this with the intention of considering the results as an estimation of the true margins.

The direct system provides very complete information about the calculation of the total margins and its components, but the procedure is very complicated and expensive; nevertheless, it is a suitable system to study the margins of certain channels or products. A less perfect system is the indirect one, which consists on comparing the statistics or the prices information in the different phases of the commercialization. A disadvantage of this system is that frequently the available statistics do not talk about comparable products with regard to the quality and other physical characteristics, as well as the passed time between the different stages that the prices for the comparison of. It is by this, that sometimes is recommendable to combine both systems.

In this investigation it was used the direct method, although it is more complicated and expensive, it is more reliable according to the gotten information.

Used information

The information about buying and selling prices were gotten directly from the main actors during the marketing process, they were considered according to the respective bought and sold quantities of the product to get more real prices.

Estimation process

For the estimation of the commercialization margins its necessary to be sure that during all the process the used information is comparable, it means, that it refers to the same unit and quality of the products, either they are elaborated or not.

In the commercialization process from the producer towards the final consumer different products are obtained, thus the prices of the pig that receives the producer, are not directly comparable with the sale prices of the meat to the final consumer. The non comparability of these prices is because there is a process of transformation of the pig in which diverse sub-products are obtained. In this case to calculate the margins it must be determined the equivalent value to one ton of sub-product of the price received by the producer, according to the required pig to produce it. This way, the total absolute margin of commercialization (M) its calculated by the difference between the value of the product in consumption (PC) and the value corrected in the production (Pp) plus the commercialization costs which are gotten during the process (CC); it means $M = Pc – Pp – CC$.

In this sense, a commercialization margin refers to the difference between the sale price of a unit product by a commercialization agent and the payment done in the purchase of the amount of the product equivalent to the sold unit. Furthermore, the margins are constituted by a number of components corresponding to different costs and benefits from the agents, such as the value in money of the used work, the transportation, the materials, the packages and packing used, the publicity, the depreciation, the taxes, the benefits, the interests, rents and other costs, which are denominated commercialization costs (CC) (García *et al*., 1990).

Commercialization costs

To calculate the commercialization margins of the pig meat they are defined as components of the commercialization costs (CC), incurred by the different participant agents in the process, the direct manpower, the transportation cost, the electricity, the water, the machinery depreciation, different administrative expenses, indirect manpower, and other costs.

Consideration of sub products

In the case of cattle products and according to Caldentey (1979) who indicates that whatever the system used in the calculation of the commercialization margins, it is of great importance to carefully considerate the aspect related to complementary sub-products and products. As it was mentioned before, it is necessary to compare it with the equivalent amount, but the problem resides in determining which that equivalent amount is.

A practical rule to solve this problem can consist on correcting the price to the producer diminishing it in the percentage represented by the sub products. This percentage can be in physical terms or in terms of value, and it is calculated in the phase when the main product and the sub-products are separated. According to this, the commercialization margin is calculated by the difference between the value of the product in

consumption and the corrected value during the production. In this sense, to calculate this equivalent amount, it was used the yield in channel that is gotten from a pig, which is in average of the 79,9 %, in agreement with studies reported by the Supports and Services to the Agricultural Commercialization (ASERCA) (1996), consequently the value corrected in production was determined, and it allowed to make the prices comparable of the product throughout the commercialization process and to calculate the corresponding margins.

RESULTS AND DISCUSSION

Production system

In the South region of the state of Mexico the extensive pig production in a 63,63 % predominates, characterized by breedings of 5 to 50 pigs per unit, any automation, native breed , without strategies for a genetic improvement, local market or private consumption and any organization for the production. On the other hand, the semi intensive or semi technological system occupies rest 36,37 % of the production, which characterizes by average operations of 150 pigs, low technology, dependency on pure breeding and replacement in the fattening, regional market and median organization of the producers.

Agents and channels of commercialization

In the pig production activity, there are different schemes and agents of commercialization of the product, and they are directly related to the system exploitation.

In this sense, the main agents that take part in the process of commercialization of pig production in the south of the state of Mexico are: the producer, the collectors, the retailers, the restaurants, and the final consumer. It is important to say that the municipal slaughterhouse only participates offering the service of slaughtering to collectors and retailers.

The traditional channel of commercialization of the meat of pig identified in the south of the state of Mexico was: from the farm (producer) to the collector, then to the slaughterhouse, then to the retailers and at last to the final consumer. There is a variant in this process of commercialization, before the product arrives to the final consumer goes first through the restaurants, they get the product from the collectors directly and this people only go to the slaughterhouse to slaughter the animals.

Its important to say that in the region there were identified only two collectors, one is a regional collector and the other is brings the pigs from the states of Jalisco and Guanajuato, mainly.

It was identified an alternative channel of commercialization: from the producer to the retailer and from the retailer to the final consumer; the slaughter takes place *in situ* by the retailers; and they supply the restaurants (Figure 1).

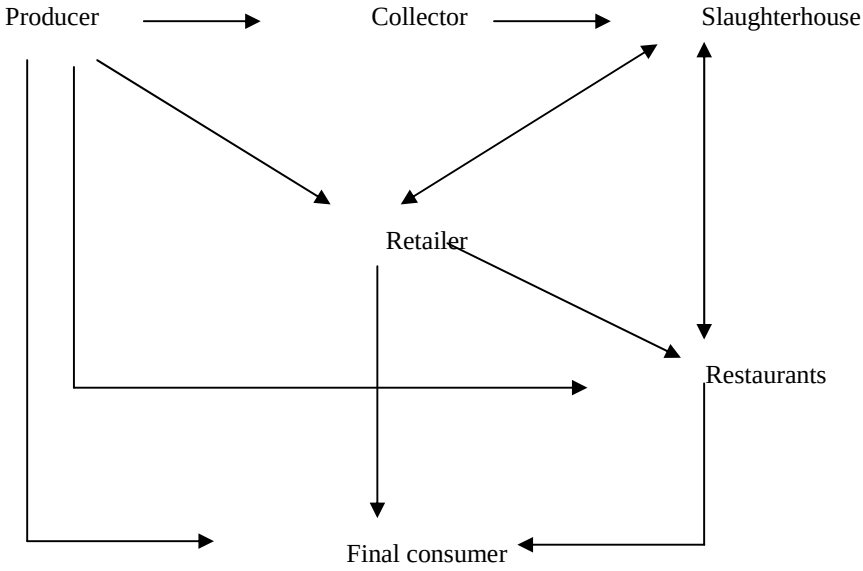

Figure 1. Channels of commercialization of pork produced in the south of the State of Mexico.

Coefficient of transformation of boned pork meat

For the present analysis, the transformation coefficient is defined as the amount of the gotten final product (measured in kilograms) by each kilogram of pig. In this sense, Melendez *et al.* (2005) says that from an alive pig of 100 kg weight its gotten an average of 79,80 % in yield. Flores and Agraz (1982) point out that from the total weight of an alive pig of 100 kg its gotten as a maximum yield in channel only the 76,20 %. On the other hand, ASERCA (1996) mentions that in average the yield of an animal of 100 kg weight is the 79,90 %, this data was used in this study to determine the equivalent quantity, which is similar to the yields mentioned before.

Sale agents

In the production and commercialization of the pig in the south of the state of Mexico there are three different kinds of sale agents of the product identified: the producers, the collectors, and the retailers. Nowadays, in the process of commercialization participates around 45 organized producers (28 in Tejupilco and 17 in Luvianos), two collectors and 51 retailers.

In this sense, the pig producers of the region sell their product mainly to the retailers in a 59,36 %, to the final consumer in a 26,09 % and to the restaurants in a 14,55 %. On the other hand, the collectors sell the product in a 94 % to the retailers, and they sell a 92,60 % to the final consumer and the 7,40 % remaining is for the food dealers (Table 1). In all the cases the municipal slaughterhouse only provides the slaughtering service to the different agents.

Commercialization costs

The commercialization costs related to the different participant agents during the commercialization process of the pig meat, increase in proportion to the progress of the process until it arrives to the final consumer. In this sense, the producers had costs of commercialization of 1,19 $/Kg, the 23,52 % of the total commercial costs; the main headings that affected these costs were the direct manpower and the transportation costs. On the other hand, the collectors registered costs of commercialization of 0,23 $/Kg, the 4,54 % of the total costs, represented basically by expenses of transport. In the last link of the commercialization chain, the retailers had the majors costs of commercialization with 3,64 $/kg, it means, 71,94 % of the total costs added during the whole commercialization process; the main headings were in sequence of importance, direct manpower, the expenses of transport and other concepts represented basically by the rent of the premises, which represented 27,27 % of the costs incurred across these agents.

Throughout all the process of commercialization the concepts that had more influence in the commercialization process were the direct manpower (35,38 %), the rent of premises (27,27 %), the expenses of transport (19,36 %) and the electric power (10,34 %) (Table 2).

Table 1. Main agents of sale of the product (%).

Place/ Agent	Producer (%)	Collector (%)	Retailer (%)	Average (%)
Retailer	59,36	94,00	--	51,12
Restaurants	14,55	1,00	7,40	7,65
Final consumer	26,09	5,00	92,60	41,23
Total	100,00	100,00	100,00	100,00

Table 2. Costs of commercialization ($/kg)

Concept / Agent	Producer	Collector	Reatailer	Total	Part. (%)
Expenses of transport	0,47	0,17	0,37	1,01	19,96
Direct manpower	0,62	0,03	1,14	1,79	35,38
Electric power	0,03	0,003	0,49	0,523	10,34
Water	0,04	--	0,01	0,05	0,99
Depreciation	0,04	--	0,23	0,27	5,34
Administrative costs	--	--	0,03	0,03	0,59
Indirect manpower	--	--	0,01	0,01	0,20
Others	--	0,02	1,36	1,38	27,27
Total	1,19	0,23	3,64	5,06	100,00

Sale prices of pork

The average sale price reached by the producer was of 10,33 $/kg, whereas the intermediary registered an average price of 11,92 $/kg, this is a 15,39 % more than one reached by the producer; on the other hand, the retailers obtained an average price of sale of 39,39 $/kg (281,31 % more than the one registered by the producer).

In relation to the participation of the agents in the final sale price, the conclusion is that the producers only participate with 26,22 % of the final sale price; the intermediaries with the 4,04 % and the retailers have a major participation with the 69,74 % (Table 3).

Gross margin of commercialization (GMC)

The gross margin of commercialization (GMC) indicates that each peso that was paid by the consumer when buying a kilogram of pig meat, the intermediaries, in this case, the collectors of pigs and the retailers, got the 73,78 % from the final price, it is equivalent to the 29,06 $/kg of the sold product, whereas the producer only got the 26,22 % from the price that the consumer paid (Table 4).

Table 3. Participation of the agents in the sale price of the pig meat.

Month/Agent	Producer price ($/kg)	Part. (%)	Collector price ($/kg)	Part. (%)	Retailer price ($/kg)	Part. (%)
Jan	10,22	26,08	11,78	3,96	39,21	69,96
Feb	10,27	26,34	11,78	3,85	39,01	69,81
March	10,30	26,27	11,79	3,79	39,21	69,95
Apr	10,25	26,25	11,79	3,94	39,04	69,81
May	10,27	25,96	11,78	3,80	39,57	70,24
June	10,25	26,03	11,78	3,87	39,39	70,10
July	10,24	26,19	11,78	3,94	39,09	69,87
Aug	10,24	26,19	11,78	3,94	39,09	69,87
Sept	10,24	26,13	11,78	3,93	39,18	69,94
Oct	10,49	26,87	11,78	3,31	39,03	69,82
Nov	10,49	26,16	11,99	3,74	40,08	70,10
Dec	10,70	26,21	13,30	6,36	40,84	67,44
Average	10,33	26.22 */	11,92	4,04 */	39,39	69,74 */

*/: Average measured

Table 4. Gross margin of commercialization (GMC).

Month	Sale price ($/kg)		GMC (%)
	Producer	Retailer	
Jan	10,22	39,21	73,94
Feb	10,27	39,01	73,67
March	10,30	39,21	73,73
Apr	10,25	39,04	73,74
May	10,27	39,57	74,05
June	10,25	39,39	73,98
July	10,24	39,09	73,80
Aug	10,24	3909	73,80
Sept	10,24	39,18	73,86
Oct	10,49	39,03	73,12
Nov	10,49	40,08	73,83
Dec	10,70	40,84	73,80
Average	10,33	39,39	73,78

Note: GMC = (Price to the consumer – Price to the producer) / Price to the last consumer x 100

Gross margin of commercialization (GMC) in the intermediation

Of the gross utility percentage resultant in the intermediation (73,78 %), the retailers obtained a greater margin of commercialization, since by each kg of sold meat they obtained $27,47 of utility and they participated with the 69,74 % of the gross utility; whereas the collectors obtained 1,59 $/kg, it means, they only obtained 4,04 % of this utility (Table 5).

It's important to say that despite of the fact that the retailers get a major gross profit, they also have major commercialization costs provoked by the transportation of the product, the rent of the premises, the manpower and the electric power among others.

Total commercialization margins

Analyzing the total commercialization margins, it means, when we include to the difference of the prices the commercialization expenses, it was found that the total average margin was of 23,93 $/kg, from it the retailers got the major average margin corresponding to 23,52 $/kg, and the rest 0,40 $/kg was for the collectors.

In the same way, it is important to point out that the best commercialization margins gotten by the retailers were registered during november and may with sums of 24,23 and 23,93 $/kg respectively. On the other hand, the collectors got their major commercialization margin in december with an approximate sum of 1,41 $/kg (Table 6)

CONCLUSIONS

The pig production in the south of the state of Mexico is developed under a extensive production system (63,6 %), which represents an important which represents an important source of income for the families of limited resources; the process of commercialization of this activity, in order to take the product to the table of the consumers, is undertaken by diverse agents, between whom they excel: the producers, the intermediaries, the slaughterhouse (that acts like lender of the service of slaughter), the retailers or butchers, the restaurants and the final consumers; which conform the identified channel of traditional commercialization in the studied region.

With respect to the participation of the agents in the final price of the product, it was found that the retailers participate with 69,73 %, the intermediaries with 4,04 %, whereas the producers only participate with 26,22 %. In this sense, when including to the difference of prices the commercialization costs, we found that the total average margin was of 23,93 $/kg, from it the retailers obtained the greater average margin corresponding to 23,52 $/kg, while the rest 0,40 $/kg was for the collectors

Table 5. Gross commercialization margins (GCM) in the intermediation.

Month	GCM from the collector to the retailer		GMC from the retailer to the final consumer	
	(%)	($/kg)	(%)	($/kg)
Jan	3,98	1,56	69,96	27,43
Feb	3,87	1,51	69,80	27,23
March	3,80	1,49	69,93	27,42
Apr	3,94	1,54	69,80	27,25
May	3,82	1,51	70,23	27,79
June	3,88	1,53	70,09	27,61
July	3,94	1,54	69,86	27,31
Aug	3,94	1,54	69,86	27,31
Sept	3,93	1,54	69,93	27,40
Oct	3,31	1,29	69,82	27,25
Nov	3,74	1,50	70,08	28,09
Dec	6,37	2,60	67,43	27,54
Average	4,04	1,59	69,74	27,47
Total			73,78	29,06

Note: GMC = (Price to the consumer – Price to the producer) / Price to the last consumer x 100

Table 6. Total commercialization margins by type of agent.

	Producer-Collector (Margin 1)				Collector-Retailer (Margin 2)				Retailer-Producer (Absolute margin)			
Month	BP	CC	SP	M	BP	CC	SP	M	BP	CC	SP	M
Jan	10,22	1,19	11,78	0,36	11,78	4,79	39,21	22,64	10,22	5,98	39,21	23,00
Feb	10,27	1,19	11,78	0,31	11,78	3,87	39,01	23,36	10,27	5,06	39,01	23,68
March	10,30	1,19	11,79	0,30	11,79	3,87	39,21	23,56	10,30	5,06	39,21	23,85
Apr	10,25	1,19	11,79	0,35	11,79	3,87	39,04	23,38	10,25	5,06	39,04	23,73
May	10,27	1,19	11,78	0,31	11,78	3,87	39,57	23,93	10,27	5,06	39,57	24,24
June	10,25	1,19	11,78	0,33	11,78	3,87	39,39	23,74	10,25	5,06	39,39	24,07
July	10,24	1,19	11,78	0,35	11,78	3,87	39,09	23,44	10,24	5,06	39,09	23,79
Aug	10,24	1,19	11,78	0,35	11,78	3,87	39,09	23,44	10,24	5,06	39,09	23,79
Sept	10,24	1,19	11,78	0,35	11,78	3,87	39,18	23,54	10,24	5,06	39,18	23,89
Oct	10,49	1,19	11,78	0,10	11,78	3,87	39,03	23,38	10,49	5,06	39,03	23,48
Nov	10,49	1,19	11,99	0,31	11,99	3,87	40,08	24,23	10,49	5,06	40,08	24,54
Dec	10,70	1,19	13,30	1,41	13,30	3,87	40,84	23,67	10,70	5,06	40,84	25,08
Aver.	10,33	1,19	11,92	0,40	11,92	3,95	39,39	23,52	10,33	5,14	39,39	23,93

Note: M = SP –BP -CC
M: Margin, SP: Sale Price, BP: Buying Price, CC: Commercialization costs

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Submitted November 20, 2008 – Accepted May 06, 2009
Revised September 24, 2009