TECHNICAL-ECONOMIC ANALYSIS OF THE PIG EXPLOITATIONS IN THE AUTONOMOUS COMMUNITY OF GALICIA (SPAIN)

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Abstract

Since the mid-50's of the past century in Galicia has evolved subsector pig until today where an average 1,220,000 slaughtered pigs with a production of 94,400 tonnes per year originate mainly from industrial exploitations 581 breeding and the 745 existing feedlots. The sector is in a complex process of adaptation to new market conditions characterized by an increase in production costs. This paper shows the results of the analysis of the production process of 33 pig exploitations bait selected randomly in 4 provinces of Galicia. The results are organized so that from the weight (Kg) and the average price per (€/Kg) of the animal priming and marketed analyzes all elements of the productive process (acquisition of piglet, food, animal health costs, costs of legal proceedings production facilities, costs of hand work) in terms of their influence on the performance end of it. It shows the different strategies exploitations classified according to their efficiency.

Keywords: Subsector pigs, productive process, efficiency analysis

1. Introduction

Spain is the second country of the European Union and the fourth country in the world in terms of pork production. In recent years, pork production has grown strongly and continuously in Spain. The last census reported that there are a total of 23,5 million heads, of which 2,5 million is in line with Iberian pigs, reaching a production of 3.122.577 kg of meat. Most of the pig hut is distributed in Catalonia, with 26% of the total, followed by 18% of Aragon and Castile and Leon 14%. (I.N.E.,1999). The distribution of holdings reaches 31.000 pig exploitations.

Throughout the past decades occurred processes of modernization and verticalization of production chains. The merger is also very sharp and there are very little independent exploitations. In most cases they are cooperative societies or associations with the feed, or even to slaughter their own meat industries. The production of pig meat cannot be absorbed by internal demand, so that exports are an essential resource for the survival of the sector. Exports came to 617.300 tons or representing an increase of 16,8%. The main client of this foreign trade is France with 32,1% of the total, followed by Portugal with 19,4%. According to industry

experts, by 2010 production will continue growing strongly in Spain (12%) while it will slow down in most of the European Union.

When making an overview of the pig Galician compared with Spanish noted the significant weight loss within the national context in the past thirty years. While the total Spanish census has tripled in three decades, Galician remained constant. The pig subsector is one of the most important subsectors of the industrial Galician livestock. In 1997, the pigs received a total of 114,26 € million which represented 10,5% of the final Galician production livestock (PFG).

In Galicia in 1998 had a total of 841 exploitations with a total production of 82.779 places. Most of the exploitations, 74% had a capacity of 99 units or less, while 70% of the places were concentrated in exploitations bait was 385, 89% of such exploitations had room for 200 or more concentrated where 98% of places bait. In 1998 there were 206.789 places in fattening exploitations. In Galicia in 1998, the average price of animal feed was 0,83 € / kg pig and of piglet was 29,33 €/UD (I.G.E., 2007).

The prices of feed compounds showed a sharp rise over the past months, which affected all livestock sectors, but especially for pig farmers. This increase is mainly due to poor grain harvest. (Ministry of the Presidency, 2000)

Royal Decree 324/2000 (Ministry of the Presidency, 2000) and R.D. 3483/2000 (Ministry of the Presidency, 2000) amending the previous, established the basic standards of management of pig exploitations. Its main objectives were: 1) Be a new regulatory framework in the management. 2) Adjust the harmonious growth of the sector. 3) Reduce the maximum dissemination of diseases. 4) To preserve natural resources and protect the environment.

1.1 SWOT Analysis of the pig subsector in Galicia

A SWOT synthetic analysis of the pig subsector in Galicia produces the following results

Weaknesses

- Most of the pig exploitations do not have the relevant management plan slurry.

- The health status of Spanish pig hut poses certain limits on exports. One of the main problems is Aujeszky's disease.

- The urban pressure put up the price of rural land that makes it difficult causes install new exploitations, especially in coastal areas.

Strengths

- The favorable reception by the Royal Decree 324/2000 of the pig sector, mainly in its zootechnical classification and productive capacity.

- The protection of the environment increases the maximum capacity defined pig exploitations.

- The establishment of the minimum distance promotes a proper health management of pig exploitations.

- The government and industry can anticipate the emergence of potential epizootics.

- The production systems "throughout the entire inside out" as a measure of biosecurity on bait exploitations and transaction of piglets, can improve sanitary conditions.

- Implementation of the farmers by the rules in respect of sanitary infrastructure, and measures of hygiene.

- Proper maintenance of the Registry Book of the exploitation and the correct identification of the animals, which ensures both the control on the movement of animals and the traceability of the final product.

- Trend to the capacity increase of exploitations, and that is causing a lowering of production costs.

- The application of new production systems reflect the sector's interest in being in the forefront.

Threats

- Environmental management of slurry and manure, disposal of pig carcasses can cause sanitary risks and environmental damages.

- The competition between tourism and the pig is causing the closure of many exploitations, especially in coastal areas.

Opportunities

- Ensure that the distribution of pig exploitations in all territory results uniform and rational with available resources.

- Control and eradication over the medium term of certain diseases.

- The significant support that will ensure the start of a one-stop shop to facilitate administrative tasks to the farmers.

- The use of genetic of quality will allow for greater adaptation to market demand, while minimizing costs and offering different products.

- The guarantee of traceability will allow increasing the consumer confidence in pork products.

2. Object

Development and validation of an analytical methodology to identify in the current conditions in the near future, the current situation and the potential production in Galicia for the production of the pig subsector by learning from the current situation. Specifically this study aimed to explore the technical and economic situation of the exploitations selected.

3. Materials and methods

3.1 Area of study

The work covered the entire region of Galicia.

3.2 Preparation of census exploitations the pig subsector

It is made a request to the Rural Counseling requesting information on the pig sector in Galicia. From the response is established a census classified into three groups:

1   Industrial breeding exploitations: 581.

2   Small exploitations with breeding: 2.749

3   Feedlot: 745.

3.3. Selection and distribution of the sample

30 exploitations were selected randomly from groups 1 and 3 (industrials with breeding and feedlot).

They were located geographically and established a program of visits for the completion of the questionnaire, consisting of telephone contact with the owner of the farm and arrange an appointment for the survey. In this first contact was made in explaining the objectives of the survey and were guaranteed anonymity in all phases of it.

3.4. Elaboration and implementation of the questionnaire

The questionnaire was divided into three parts; 1) location of the farm. 2) specific purpose of this work, related to the production process in which they ask for race and working method as well as the costs of this process, 3) refers to the facilities available to the operating state that the data were not provided by respondents, because in most cases unknown. The interviewer made the measurement field for each section.

Is shown as an example to analyze the questionnaire conducted at an exploitation.

Survey nº1

1   The situation of exploitation - Santiago of Compostela (Coruña)

2   Race - Pietrain
        Use system - Intensive
        Number-300
        Percentage of lows exploitation - 2%
        Reset - No
        Bait end units - 294
        Hours/year dedicated workforce - 792
        Desired weight of pigs fed - 105 kg
        Price € / kg fattening pig – 1,15
        Kg. of feed they eat to be fattened - 220
        Kg. feed prices - 0,22 € / kg
        Piglet price - 40 € / u
        Zoosanitary expenditure – 178,5 € / year
        Cost of electricity every 2 months - 45 €
        Veterinary expenditure - 75 € / year
        Labor costs € / year – 5.544

3   m² of accommodation - 240

        m² store - 24

        m³ of liquid manure pit - 200

        Cost of accommodation - € 54.000

        Cost of storage – 1.200 €

Cost of the slurry pit - € 11.000

3.5. Analysis of the questionnaire

When the data collection finished, its organization and subsequent analysis was carried out using the program SPSS[TM] 15.1. The analysis were of descriptive type and correlation among which we have

Central tendency:

Media. Sum of all values divided by its number.

Median. Value below which is 50% of cases

Fashion. Value that is repeated over

Sum. Sum of all values

Scattering:

Standard deviation. It measures the degree to which the values a variable that takes away from the average. It is obtained as the square root of the variance.

Variance. Measure of dispersion is obtained by dividing by n-1 the sum of the squares of the differences between each value and the average.

Amplitude. Difference between the maximum and minimum value.

Minimum. Smaller value.

Maximum. Larger value.

Form of Distribution.

Asymmetry. Index that expresses the degree of asymmetry of the distribution. Positive asymmetry indicates that more extreme values are above average. Negative symmetry values indicate that the most extreme are below average. Rates close to zero indicate symmetry.

Kurtosis. Index that expresses the degree, to which a distribution accumulates values in its queues, compared with the values accumulated queues a normal distribution. The positive kurtosis indicates that in the queues of distribution there are accumulated more cases than in the queues of a normal distribution. The kurtosis indexes close to zero indicate similarity with the normal curve.

Correlation Analysis

The standard measure of correlation is the correlation coefficients, which are numerical indexes that have the important property to quantify the degree of linear relationship between two quantitative variables. It is usually selected the following:

Correlation coefficient of Pearson (Equation 1). The most commonly used to study the degree of relationship between two quantitative variables. It is obtained typifying the average of the products of differential ratings in each case (deviations from the average) in the two correlated variables:

$$\rho_{xy} = \frac{Cov(x, y)}{\sqrt{Var(x)Var(y)}} \qquad (1)$$

Cov   Covarianza

Var   Varianza

4. Results

Race - All feedlot use the same race of pigs: the Pietrain, which comes from Belgium, a town called Brabant. It originated from pigs Normans. It has a high-quality channel, but low growth rate, conversion index and reproduction (requires a high level of food to increase its weight and reproduction). By contrast is the highest percentage of noble pieces, but with quite fat intramuscularly. It is one of the races that which shows PSE (white meat, soft and exudative). In Spain is considered one of the most muscular of the world, besides having best qualities as a reproductive and production of ham, very well adapted to the different means of exploitation.

Use system - In all cases the use is intensive. The characteristics of the installations, discussed in another work presented at this conference and facilities of management and increase profitability, incites that this is the most appropriate method for exploitations breeding pigs. Changes in environmental regulation and management of animals for meat production, are promoting the need for soften allowing the introduction of more extensive productive processes. A significant number of exploitations surveyed were raised that possibility in the future.

Number of pigs - The average number stands at 967 pigs per exploitation and year, the median is 840 and the fashion 800. The standard deviation of this variable reaches a value of 613, reaching the rank of the same in 2.250, which states very clearly the different sizes of exploitations. Orense province is presenting the largest installations with 1.230 pigs per farm on average. The largest exploitation of the surveys was located in the province of Lugo with 2.400 pigs. On the other side smaller exploitations are located in Pontevedra, which averaged 716 pigs are like the smallest of all exploitations with 150. As expected the number of pigs and positively correlates well with all the economic variables. In the opposite direction is found the percentage the lows per death which decreases, suggesting that larger installations are more efficient in the early stages of rearing which are often the most crucial, and this is because it is most modern installations.

Percentage of casualties in the exploitation - the medium area is 2,52%, the median stands at 2,45% and the fashion is 2%. The standard deviation of this variable reaches a value of 0,008, reaching the rank of the same at 4%. Province Lugo is in this case with a 2,59% which is the highest value and at the other end is Orense with only 1,76%. The correlation analysis shows interesting results. As had been discussed the size of exploitations is related to the decrease in the number of casualties, which is the same in the work on the exploitation, so the devoted hours to the management are correlated negatively in -0,352. On the contrary seems to have no relation to the hours for disinfection with at -0,01 not being significant Pearson's

correlation. The reason behind this may be in the fact that a greater number of hours is due to installations and cleaning systems are older.

Hours / days of labor - the medium work in the Galician pig exploitations is 2,68 hours/day, the median and the fashion is at 2 hours. The standard deviation of this variable reaches a value of 1,28, reaching the rank of the same in 2. It is in Orense, where the average is at 4 hours and Lugo at 2,44 to the contrary. The correlation analysis are especially significant regarding to the size of exploitation 0,55. As a result of this variable shows the dedication to the Galician pig farm is of partial character, in many cases be linked to other activities such as the exploitation of veal.

Costs of labor € / year – the average of this cost, of great importance to the profitability of these exploitations are located in the 7880 €, the median is 5.880 € and fashion have the same value. The standard deviation of this variable is worth 3.325 €, with the same range of 13.075 €. The province that spent more on labor per exploitation is Orense with 10.882 € on media and the least Pontevedra is just of 6.205 € of media. The correlation analysis, shows as expected, high correlations with all dimensional variables and significant negative correlations with variables related to the bad management of exploitations such as the percentage of lows.

Price € / kg fattened pig - The result is always the same for this variable and has a value of 1,15 € / kg. That price has not increased in recent years, but it has got down.

Kg of feed consumed per pig – Considering that the average weight of sale of the pigs in Galicia is at 110 kg, it is necessary to achieve an average of 277,9 kg / pig, with a mode of 300 Kg. / pig and a range of 100 kg. By province are pigs of Orense with 316 kg while in Coruña on average is 256 kg. The feed consumption is highly correlated, values 0,596 and 0,564, with variables such as hours dedicated of the exploitation. These results seem to indicate a lower efficiency of the work, which may be associated with older installations that require more work and represent worst conditions for animals that have an impact on declines in production.

Price of Kg. of feed - The medium price stands at 0,26 € / kg, median and mode at 0.30. The standard deviation of this variable reaches a value of 0,03, reaching 0,08 in the range. By provinces the prices do not seem to vary and do not seem to depend directly of the given consumption which is not correlated with consumption.

5. Conclusions

The pig subsector in Galicia has gone through a phase of recession in recent decades. At present, as a result of difficulties in the markets and rising prices of raw materials need to enter in a phase of change that will suppose a new process of recession in the number of exploitations.

It should be noted that currently there are two types of productive models in the pig installations of Galicia. On one hand we find with exploitations with a greater number of years and with more traditional forms to work and other side with more modern exploitations applying a more exhaustive management in its activity. The same happens for provinces, the phenomenon of the integration in COREN (Cooperatives of Orense) more widespread in the province of Orense incites that there are the biggest and most modern installations.

A crucial factor for the future of these exploitations is in the fact of not having a sufficient size to save costs and adapt to new market circumstances. In an economic model of product prices to

the low and cost of raw materials and models of production increasing, the solutions have to pass by the diversification and specialization or by increasing the size. However, obtained results indicate that none of these circumstances is occurring.

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