

THE EFFECT OF FARROWING RATE AND NUMBER OF PIGLETS WEANED PER LITTER ON PRODUCTION COSTS OF COMMERCIAL IBERIAN HERDS IN EXTREMADURA (SPAIN)

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ABSTRACT

The effects of farrowing rate (FR) and the number of weaned piglets per litter (NWP) on the economic profitability of nine Iberian pig farms managed in different production systems were studied. Economic and production data were used to perform a cost analysis per sow, litter and piglet. After the cost analysis was performed, the marginal profitability and the net income resulting from the NWP and sow FR were calculated according to current market prices. It can be concluded that FR and NWP did not compensate the production costs in the extensive farms. In contrast, intensive production farm compensated the production costs and even yielded economical benefits.

Key words: Iberian piglets / fertility / weaned piglets / cost analysis / profitability

1 INTRODUCTION

The region of Extremadura has the larger census of Iberian sows in Spain, with around 140.000 females (MAGRAMA, 2011), and also is the larger production region with 76.000 tons/year of Iberian pig meat (MAGRAMA, 2009). Nowadays, the increases of feed cost and the low price of Iberian pig products are reducing considerably the income of producers and, thus, many of them are quitting the economical activity. Not many economic studies have evaluated the factors that influence the profitability of Iberian pig farms. According to Sundgren *et al.* (1980) the number of piglets weaned per litter is one of the most important factors of profitability. Therefore, increasing the number of piglets weaned should be a major objective. Also, it is important to remark that the more piglets are weaned per litter, the fewer sows are needed to keep the same production level, thus reducing production costs. According to Rouco and Muñoz (2006), the greater expenses of a pig farm are the feeding costs, labor costs and depreciation costs. These authors also concluded that it is important to establish

economic control points to evaluate the farm economic performance. To determine economic indicators, it is important to study the production costs and the profitability based on market prices and the current productivity level of the farm. Thus, the objectives of the present study were to determine the effect of fertility and number of piglets weaned on the profitability and the income of farms, and also to study the changes in profitability if any of these parameters increase.

2 MATERIALS AND METHODS

Data were collected from 9 Iberian pig farms located in Extremadura that produce crossbred piglets from Iberian sows and Duroc boars. Table 1 shows a description of the different characteristics of the farms, in terms of production system, facilities, census, surface and labor. For each farm, descriptive, breeding, reproductive and productive data (Table 1) were collected, as well as the prize of the different supply types. With this data, a production index was calculated for standard sows

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Table 1: Farm description by operating system, farrowing system, census, surface and labour

Farm	Operating system	Farrowing system	Census	Surface (ha)	Labour (no. of workers)
EX	Extensive	Farrowing hut	200	35	1.5
EX1	Extensive	Traditional	45	20	0.75
SE0	Semi-extensive	Slat	150	12	0.8
SE1	Semi-extensive	Slat	250	30	1.2
SE2	Semi-extensive	Slat	200	15	1.2
SE3	Semi-extensive	Slat	350	5	2
SE4	Semi-extensive	Slat	270	20	1.2
IN0	Intensive	Slat	400	13	3
IN	Intensive	Slat	750	5	4

EX – extensive farm system 1; EX1 – extensive farm system 2; SE0 – semi-extensive farm system 1; SE1 – semi-extensive farm system 2; SE2 – semi-extensive farm system 3; SE3 – semi-extensive farm system 4; SE4 – semi-extensive farm system 5; IN0 – intensive farm system 1; IN – intensive farm system 2

based on productive life (age of sow), reproductive cycle length, fertility, number of farrowings, and also number of piglets born, born alive and weaned. In addition, the total costs per year of the different supply types, as well as the overall production costs, were calculated as: Total Costs = FC + VC:

a) $FC = PD + LD + COF$

- FC: Fixed Costs
- PD: Plant Depreciation
- LD: Land Depreciation
- COF: Opportunity Fixed Costs

b) $VC = DS + CF + CL + EV + ES + CR + EA + COV$

- VC: Variable Costs

- DS: Depreciation of Sows
- CF: Cost of Feeding
- CL: Cost of Labor
- EV: Veterinary Expenditures
- ES: Supply Expenditures
- CR: Cost of Repairs
- EA: Additional Expenditures
- COV: Opportunity Variable Costs.

From the overall annual cost of each farm, the unitary cost of production by sow and year, and the unitary cost of production per sow and litter were computed. For each farm, given the mean cost of a farrowing and the number of piglets weaned per sow and year, the unitary cost of a weaned piglet was calculated. In addition, by adding the cost of growing a piglet (from weaning up to

Table 2: Farrowing rate and number of weaned piglets per litter on farm observed

Farm	Farrowing rate	Number of Weaned piglets
EX	80.00	6.39
EX1	95.00	6.36
SE0	78.85	5.85
SE1	80.00	7.33
SE2	83.00	6.54
SE3	80.00	6.32
SE4	85.00	6.96
IN0	78.85	6.87
IN	86.90	7.42
Mean	83.07	6.67
Stan. Dev.	5.30	0.51

EX – extensive farm system 1; EX1 – extensive farm system 2; SE0 – semi-extensive farm system 1; SE1 – semi-extensive farm system 2; SE2 – semi-extensive farm system 3; SE3 – semi-extensive farm system 4; SE4 – semi-extensive farm system 5; IN0 – intensive farm system 1; IN – intensive farm system 2

Table 3: Production costs per litter, weaned and commercial piglet on farm observed

Farm	Sow parity (€)	Weaned piglet (€)	Commercial piglet (€)
EX	333.29	52.16	64.95
EX1	335.85	52.97	66.64
SE0	305.55	52.23	67.64
SE1	340.89	46.51	59.30
SE2	329.52	50.39	65.79
SE3	288.26	45.61	59.28
SE4	327.07	46.99	62.40
IN0	301.27	43.85	59.26
IN	285.97	38.54	53.08

EX – extensive farm system 1; EX1 – extensive farm system 2; SE0 – semi-extensive farm system 1; SE1 – semi-extensive farm system 2; SE2 – semi-extensive farm system 3; SE3 – semi-extensive farm system 4; SE4 – semi-extensive farm system 5; IN0 – intensive farm system 1; IN – intensive farm system 2

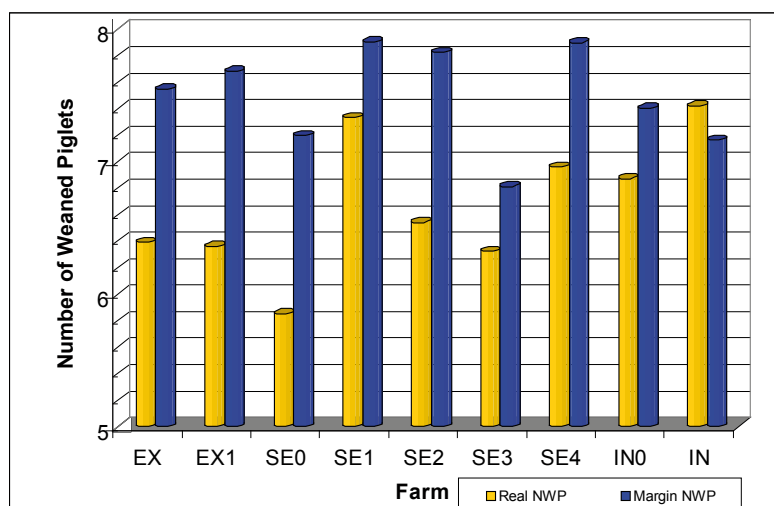


Figure 1: Real number of weaned piglets (Real NWP) and marginal number of piglet (Marginal NWP) to cover production costs by farm

23 kg) to the cost of the weaned piglet, the unitary cost of a commercial 23 kg piglet was obtained. Finally, a simulation of the profitability and net income per sow and per weaned piglet, obtained by combining four farrowing rate (FR) values (75%, 80%, 85%, 90%) and five values for number of weaned piglets per litter (NWP; 5.5; 6.0; 6.5; 7.0; 7.5) was performed for each farm. Twenty possible combinations were evaluated. Data were analyzed by using the S.A.S. *vs* 9.1 statistical package.

3 RESULTS AND DISCUSSION

Table 2 depicts FR and the number of weaned piglets per standard sow and per farm. FR ranged from 78.85%

to 95.00%, with a mean value of 83.05% and a standard deviation of 5.30%. Production system did not affect the FR. Average of weaned piglets per litter ranged from 5.85 to 7.42, with a mean value of 6.67 and a standard deviation of 0.51 piglets. In this case, it seems that intensive farms weaned more piglets than the rest of the farms.

Unitary production costs of each farm are presented in Table 3. For each sow, the cost per litter ranged from 285€ to 340€. Extensive farms had larger costs than the rest of the farms, and the intensive farms presented the lowest production costs. The cost per weaned piglet was proportional to the litter cost and was lower as litter size increased. The resulting simulated values ranged from 39€ to 53€. Intensive farms also had lower costs than the rest of the farms, which had similar costs among them.

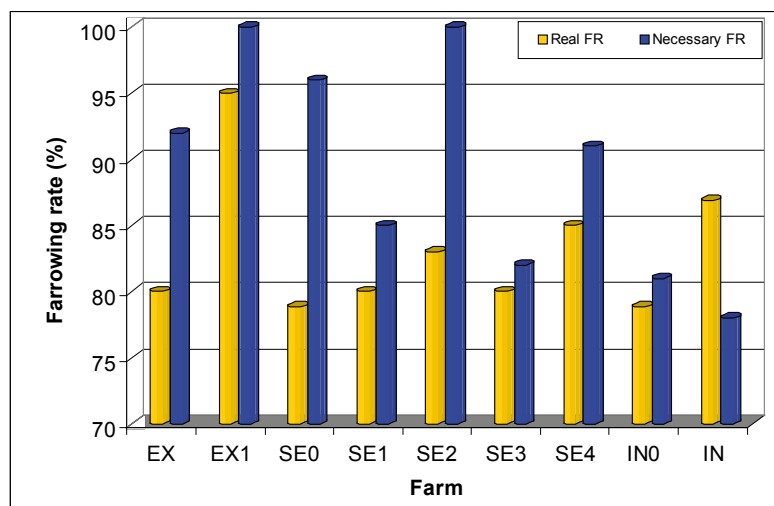


Figure 2: Real farrowing rate (Real FR, %) and necessary farrowing rate (Necessary FR, %) to cover production costs on farms observed

Finally, the unitary cost per commercial piglet is the most important value to determine the net income of a farm. Unitary cost per commercial piglet ranged from 53€ to 68€. Considering that the cost of rearing a piglet from weaning to commercial weight was similar in most farms, these differences among farms are due to the cost of a weaned piglet.

Fig. 1 represents the real NWP and the necessary (*marginal*) NWP to compensate for the production expenses. Only in one farm the real NWP compensated for the production costs. Thus, the rest of the farms weaned less piglets than those necessary to pay for the expenses. However, IN0, SE3 and SE1 farms would compensate the production costs if they increase 0.5 the NWP. However, EX, EX1, SE0 and SE2 farms must increase in more than one weaned piglet to compensate the expenses.

Furthermore, Fig. 2 depicts the current and necessary FR to cover the production expenses. Similarly, in eight of the nine farms it would be necessary to increase FR to pay for the production costs. In EX1 and SE2 farms, it would be necessary to increase farrowing rate above 100% to compensate for the expenses, and for this reason they need to improve other parameters as well, if they are to be profitable. However, farm IN would cover expenses even with a lower FR, due to its high litter size. Finally, farms IN0, SE3 and SE1 will cover expenses by increasing FR by 5%.

4 CONCLUSIONS

The large difference among farms in terms of census, production system and overall productivity does not allow to classify them according to any studied criterion.

These differences are the consequence of a lack of common production objectives.

In general, intensive production farms are more profitable than extensive farms.

The number of weaned piglets per litter in all farms is below the marginal profitability, in the actual market conditions, except for one of the intensive farms.

Similarly, the farrowing rate in eight of the nine farms will not cover production costs. Thus, improving fertility and litter size at weaning is very important to cover actual production costs and to obtain benefits.

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