ATROPHIC RHINITIS CAUSES FINANCIAL LOSSES

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Atrophic Rhinitis (AR) is a widely prevalent infectious disease of pig populations, characterised by twisting or shortening of the nose as a result of underlying atrophy of the bony structures of the nasal cavity. **Financial losses due to Atrophic Rhinitis are essentially due to a worsening of two of the most relevant production indices: Feed Conversion Rate (FCR) and Average Daily Gain (ADG)**.

In a study carried out by Donkó *et al.* in 2005, it was observed that its impact starts to become evident at the start of fattening, from 11 weeks of age. In this study, no weight differences were observed at weaning between animals that would subsequently show different grades of lesion at slaughter. However, at 90 days the animals most affected (grade 3 lesions) accounted for 29% of the total number of pigs and had grown by 3 kg less than the others (51.7 grams less per day) (1).

The study shows that from 90 days (12,9 weeks) until slaughter at approximately 190 days (27 weeks) with about 110 kg live weight, the following had occurred (Figure 1) (1):

- The most affected animals (grade 3) had grown 7.6 kg less (75.8 g/day) than those with no lesions and had taken **8 days longer to reach slaughter.**
- The moderately affected animals (grade 2) accounted for 38% of the total, grew 5 kg less (56.8 g/day) than those with no lesions and took **3 days longer to reach slaughter.**
- The animals that were only slightly affected accounted for 33% of the total.

It can be concluded from this study that severely affected animals account for about a third of the total and may grow 10-15% less than those with no lesions, whilst the growth of animals with intermediate lesions show just over 4% less growth.

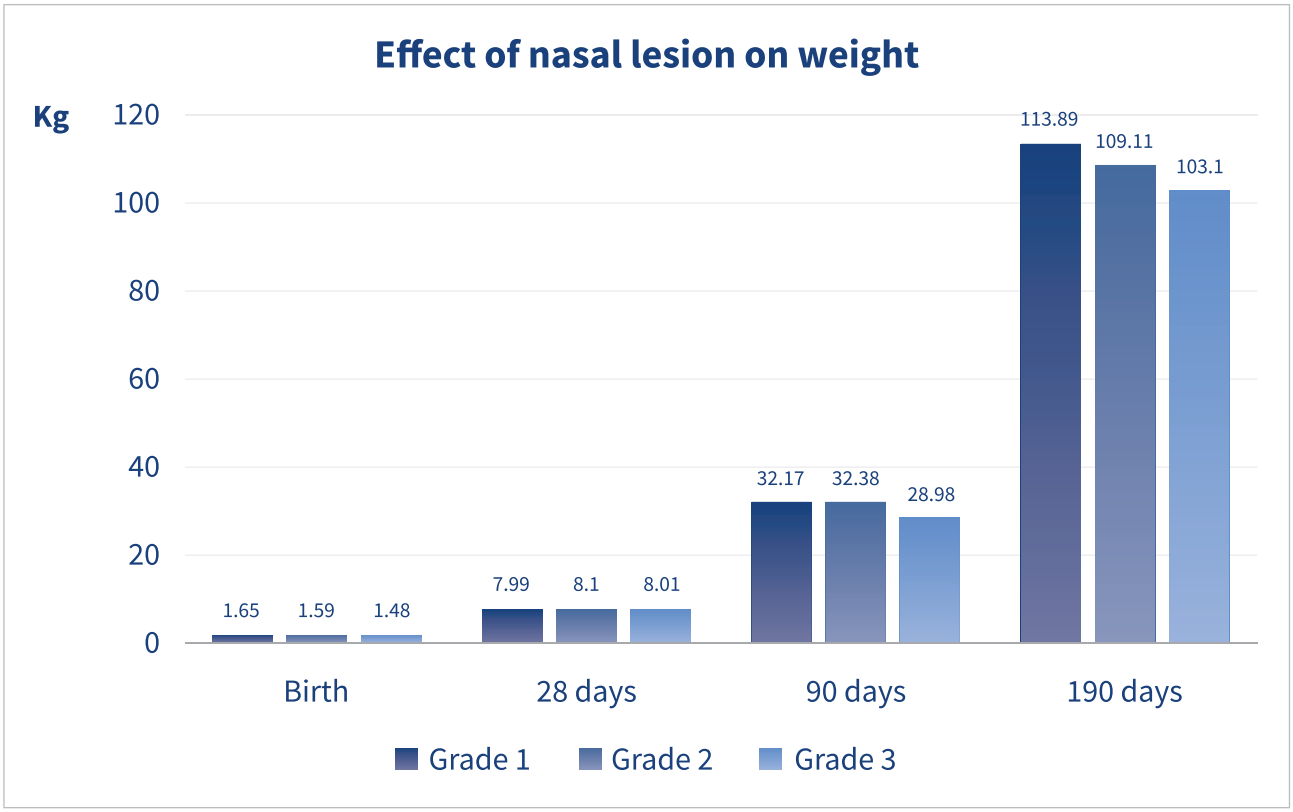


Figure 1. Effect of nasal lesion on weight at birth, 28, 90 and 190 days of age. Lesions with a score of between 0 and 4 (grade 1) are regarded as mild AR, of between 5 and 8 as moderate AR (grade 2) and above 8 as severe AR (grade 3).

Practical case

Taking into account the extra days that the pigs affected by AR take to reach slaughter weight, different calculators have been developed in order to find out exactly how much in each case the disease is costing and what is the Return On Investment (ROI) of vaccination.

Below, we present a practical case on a farm where the animals have moderate AR. Using the economic calculator developed by SIP Consultors (2), we will examine the losses incurred as a result of AR in this practical case, and why.

Let's assume that we have a herd of 1,000 animals at slaughter, which come from a farm with the following productive parameters (Table 1):

DATA ENTRY		
N° of animals		**1000**
RHINISENG® cost		**1,80** €/dose
Feed price		**251** €/tn
Consumption/animal/day		**3,0** kg
Annual cost of fattening space		**31** €
Replacement/cycle		**20** %
Number weaned piglets/farrowing		**11,5**
Mortality post-weaning		**7,3** %
Normal runts [1]		**1,0** %
Runts (n° of animals)		**10**
Runts - devaluation		**45** €/animal
Runts (n° of animals in this batch)	**25**	**2,5** %

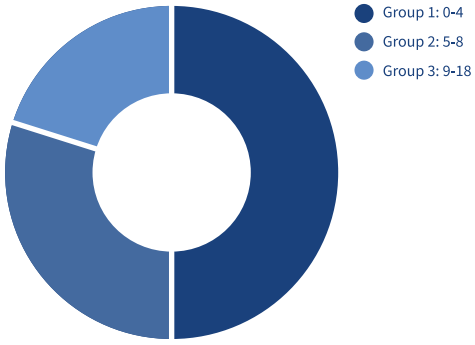
Table 1. Productive data for the farm. [1]Runts: number of animals that after the entire fattening period do not reach the commercial weight.

To find out the grade of lesion that these animals have in the nasal turbinates, it is necessary to go to the slaughterhouse and to evaluate 30 pigs (estimated quantity assuming a 10% prevalence and a 95% confidence interval). As we can see in the following table (Table 2), the nasal lesion scale ranges from 0 (completely healthy animals) to 18 (severely affected animals).

Lesion grade	N° of animals	
0	1	Mild AR (grade 1)
1	2	
2	7	
3	2	
4	3	
5	5	Moderate AR (grade 2)
6	2	
7	0	
8	2	
9	1	Severe AR (grade 3)
10	1	
11	3	
12	0	
13	0	
14	0	
15	1	
16	0	
17	0	
18	0	

Table 2. Evaluation of the nasal lesions of 30 animals in the slaughterhouse.

On this farm, from the assessment of the turbinates, we know that 30% of the animals have grade 2 lesions (moderate AR), and 20% have grade 3 lesions (severe AR) (Table 3). As we saw at the start of this article, animals with grade 2 lesions need, on average, 3 days longer to reach slaughter weight, whilst pigs with grade 3 lesions need 8 more days. These extra days involve very considerable extra cost to the farmer, in particular the extra expenditure on feed; to this, however, we have to add the cost of the fattening area itself (water, light, personnel, etc.).



Lesion grade	N° of animals	%
Group 1: 0-4	15	50
Group 2: 5-8	9	30
Group 3: 9-18	6	20
Total	30	100
Average grade of lesion		**5,1**

Table 3. Summary and average lesion score in the turbinates of the 30 animals assessed in the slaughterhouse.

From this, we can therefore calculate the extra cost involved on this farm, which in this case is €2.8 per pig at slaughter (Table 4).

	Group 2	Group 3	**TOTAL**
N° of animals	300	200	**1.000**
Extra days	3	8	**2,5**
Extra cost of feed (€)	678	1.205	**1.883**
Extra cost of occupancy (€)	76	136	**212**
Runts - devaluation (€)			**1.341**
Extra cost for AR (€)	754	1.341	**2.770**
Extra cost/pig (€)	3	7	**2,8**

Table 4. Extra cost of feed and fattening area for animals with grade 2 and 3 lesions.

Finally, knowing the cost of a dose of vaccine (€1.8 in this case), the number of weaned piglets per sow and the mortality post-weaning (Table 1), we can estimate the cost of vaccination per piglet (€0.2/piglet) (Table 5).

The difference between the costs incurred on this farm as a result of atrophic rhinitis and the cost of vaccination reflects the benefit to this farm if we invest in vaccination but had no productive losses as a result of AR. The ratio between the two values (benefit of vaccination and cost) is the return on investment, which reaches a value of **12.7**. This means that for each Euro invested in vaccination, we get back 12.7.

Vaccination cost / pig (€)[1]	**0,20**
Savings / pig (€)	**2,57**
Total savings (€)	**2.567**
Return On Investment (ROI)	**12,7**

Table 5. Calculation of the Return On Investment (ROI).
[1] Taking into account 2 doses in gilts and 1 dose in sows.

As can be seen in this article, AR entails serious financial losses, even when the lesion grade is moderate. Although it is a "silent" disease, that can be present without causing any symptoms or severe lesions, it is essential to check the status of the farm by assessment of the nasal turbinates, to evaluate the financial losses that it entails and to evaluate the use of vaccination as the principal measure of prevention.

REFERENCES

1.Donkó, T. *et al.* Association of growth performance with atrophic rhinitis and pneumonia detected at slaughter in a conventional pig herd in Hungary. *Acta Veterinaria Hungarica* 53 (3). Pp 287-298 (2005).

2. http://www.sipconsultors.com/en/