Evaluation of the impact of diseases in pig production on carcass and meat quality

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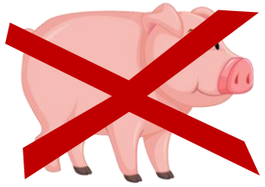
Introduction

Porcine respiratory and reproductive syndrome (PRRS) is a swine virus that causes reproductive disorders in sows as well as respiratory diseases, reduced growth rates and increased mortality in pigs of all ages.

The effects of diseases on growth performance and production cost are generally well known, but there is a great lack of information on consequences of the disease on carcass and meat quality, especially on the level of intramuscular fat.

The level of intramuscular fat (IMF) is an important determinant of meat quality characteristics such as tenderness, water retention, and therefore, its acceptability by consumers.

Studies on the impact of disease on carcass and meat quality have been conducted primarily in cattle and show that the presence of diseases influences the parameters of meat quality, mainly fat deposition and the level of marbling. No studies have been carried out in this regard in pigs.



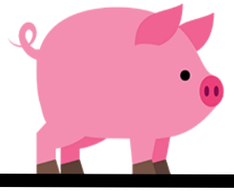
Objectives

The project aims is to assess the effect of diseases present in nurseries and finishing barn on carcass and meat quality.

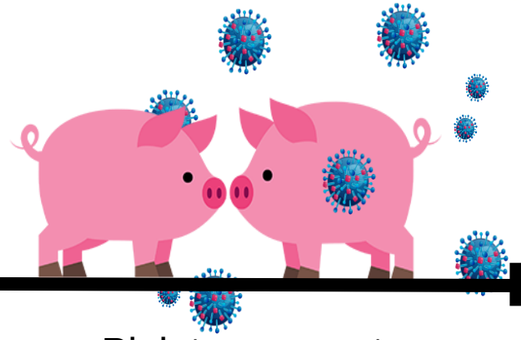
More specifically, the project made it possible to measure the impact of the disease on growth performance in nursery and fattening, measure the impact of the disease on fat and muscle thickness, as well as intramuscular fat level in vivo and determine the effects of the disease on the quality of the carcass and meat, especially on the marbling of the loin.

Materials and methods

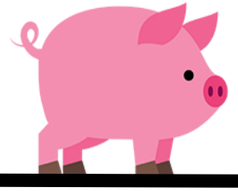
The essay was carried out on our growing-finishing Station where a natural infection model is set up inside to promotes the exposure of healthy piglets to various pathogens, including the PRRS virus, through contact with the previous batch of piglets. It is a model that keeps the same pathogens in circulation and creates a similar health challenge for each batch.



Healthy piglets gradually introduced in the nursery every three weeks



Piglets expose to PRRS virus



Finishing pigs

Carcass and meat quality

- Ultimate pH
- Color
- Marbling
- Drip loss

Evaluation of clinic signs

Ultrasound measurements

- Evolution of muscle depth
- Backfat deposition
- Intramuscular fat (IMF)

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Results

Well known production impact

The presence of PRRS and other diseases had a significant impact on the growth performance of pigs in fattening and demonstrates that the presence of the virus in the herd significantly decreases the average daily gain (ADG). This difference has a direct impact on the number of days in fattening (Figure 1).

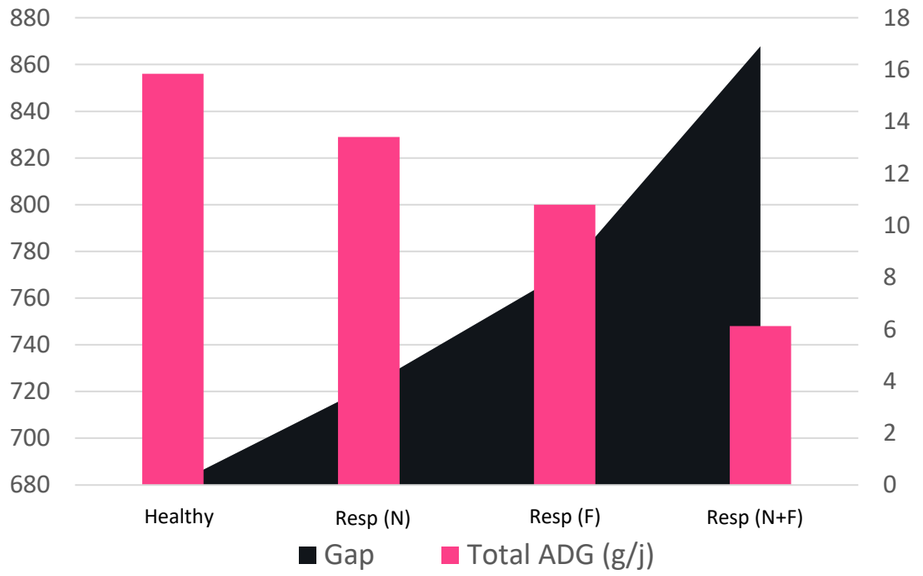
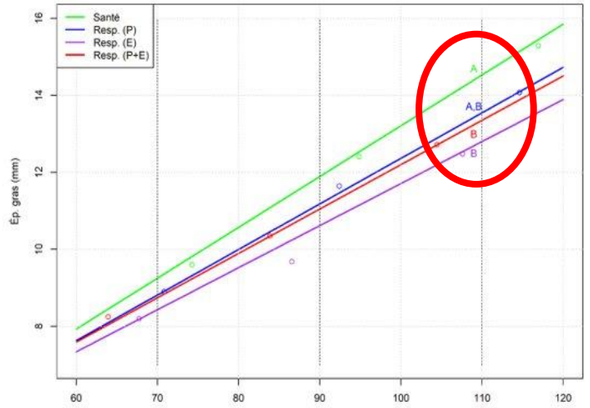


Figure 1. Average daily gain and number of additional days of breeding to lead a pig to 100 kg.

Backfat thickness

Results for back fat thickness at the end of fattening show significant differences ($P < 0.05$) between uninfected pigs **(14.7 mm),** pigs infected in nursery **(13.9 mm)** and fattening **(12.8 mm)** only, and pigs that have been ill both in nursery and fattening **(12.4mm).**



These results indicate that the presence of diseases leads to a decrease in fat deposition in pigs at the end of fattening.

Intramuscular fat

Results for intramuscular fat measured at the end of fattening demonstrate that the presence of diseases had no significant impact on the final intramuscular fat level *(P* > 0.10), varying between 2.05% for healthy pigs and 2.13% for animals that have been sick in nursery and fattening.

Variable	N	Groupe							
		Healthy		N		F		N+F	
		N	Mean	N	Mean	N	Mean	N	Mean
IMF 120 kg (%)	501	261	2,05	95	2,13	72	2,08	73	2,13

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Limited impact on quality product

The results obtained in the slaughterhouse have shown that the presence of diseases does not seem to have an impact on the various measures of meat quality (*P*>0.05). Only drip loss shows a significant difference (P< 0.05) between healthy and sick animals. Indeed, the animals in the group of pigs that had been sick at some point during their growth had a higher drip loss than the healthy animals.

However, the low number of sick pigs in the batches evaluated could have limited the observed effects

Conclusion

The work carried out by the CDPQ has made it possible to quantify the impact of diseases, in particular PRRS, by providing a better understanding of their impact on product quality. A better knowledge of the impacts on carcass and meat quality makes it possible to raise awareness in the sector and, in the longer term, to develop means to mitigate the effects of these diseases.

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