

Effects of the Porcine Reproductive and Respiratory Syndrome on the antibiotic consumption in pig weaning and fattening units in Italy

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BACKGROUND

In the European livestock sector, the antibiotics (AB) are still largely used. In the EU, data related to the sales of veterinary antimicrobial agents has been collected since 2010 (ESVAC reports). In compliance with the EU strategy to reduce the use of antimicrobials, their quantification contributes to monitor the effectiveness of the national plans in reducing AB use. These reports provide aggregated data for each national livestock system without distinguishing among species. In livestock productions, the pig sector ranks first for AB use. Several studies quantified the AB use in pig farming at regional or national levels and highlighted its correlation with farmers and veterinarians' behaviors, and farm characteristics and management. Within the framework of the European H2020 Project ROADMAP, the study objective is to provide data on the AB use in Italian pig weaning and fattening conventional industrial units differentiated for the serological status against the Porcine Reproductive and Respiratory Syndrome (PRRS).

METHODS

Data were collected from farms producing the Italian heavy pigs and selected to diverge for the occurrence of PRRS. The production sites considered were not certified as free from the PRRS, and all the animals were vaccinated. Farms were considered PRRS negative (PRRS-) when the antibody detected in the blood were very low and originate from the vaccination against PRRS and no clinical illnesses had occurred since long time. Farms were considered PRRS positive (PRRS+) when the disease was recurrent. Data cover the 2017-2020 period and AB use are expressed in mg of active compounds (ACs) per kg of produced body weight (BW). The ACs were categorized following the EU/EMA scale: B: Restrict; C: Caution; D: Prudence (Figure 1). The consistency of the database is reported in Table 1.

Category A Avoid	Category B Restrict
<ul style="list-style-type: none"> antibiotics in this category are not authorised as veterinary medicines in the EU should not be used in food-producing animals may be given to companion animals under exceptional circumstances 	<ul style="list-style-type: none"> antibiotics in this category are critically important in human medicine and use in animals should be restricted to mitigate the risk to public health should be considered only when there are no antibiotics in Categories C or D that could be clinically effective use should be based on antimicrobial susceptibility testing, wherever possible
Category C Caution	Category D Prudence
<ul style="list-style-type: none"> for antibiotics in this category there are alternatives in human medicine for some veterinary indications, there are no alternatives belonging to Category D should be considered only when there are no antibiotics in Category D that could be clinically effective 	<ul style="list-style-type: none"> should be used as first line treatments, wherever possible as always, should be used prudently, only when medically needed

Figure 1. EMA categorization of antibiotics used in animals.

Table 1. Average consistency of the considered production chains.

Production phase	Sanitary status	Number of pigs	Produced BW (kg)
Weaning	PRRS -	115,970	2,916,458
Weaning	PRRS +	65,331	1,593,631
Fattening	PRRS -	108,248	15,037,139
Fattening	PRRS +	54,410	7,440,633

DISCUSSION AND CONCLUSIONS

At weaning, the % of BW treated with class B decreased from 9% PRRS+ and 14% PRRS- (2017) to 1% PRRS+ and 10% PRRS- (2020). Along the same period, PRRS+ production system increased the percentage of BW treated with class C (45% vs 56%), while PRRS- decreased the class C (42% vs 39%) but increased the BW percentage treated with class D (44% vs 51%). At fattening, the use of class B decreased from 3% in PRRS+ and 7% in PRRS- in 2017, to 0% in 2020. In conclusion, the PRRS+ chain showed a sharply increased of AB use during the overall growing phase of pigs with highest impacts on the weaning phase. In the last 4 years, the total use of the class B was strongly reduced in the examined farms.

RESULTS

Table 2. yearly consumption of active compounds between 2017 and 2020.

	Year				SEM	P-val
	2017	2018	2019	2020		
Active compounds/total kg of produced meat (mg)						
Class of antibiotic - B ¹	0.42	0.59	0.51	0.46	0.37	0.99
Class of antibiotic - C ¹	73.7	70.5	34.9	64.1	16.5	0.38
Class of antibiotic - D ¹	293.5	266.8	258.9	251.6	139.5	1.00

¹B: Restrict; C: Caution; D: Prudence

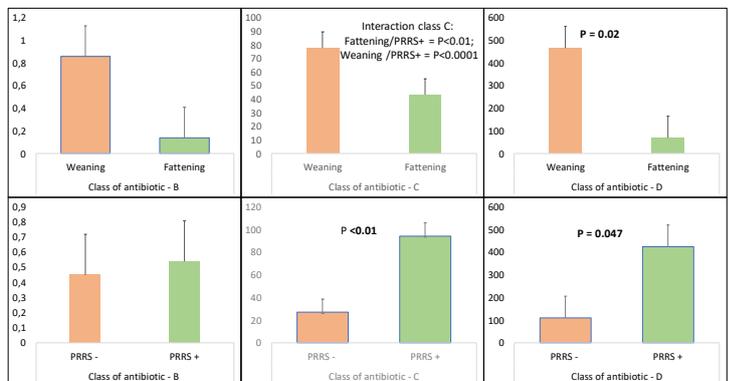


Figure 2. Consumption of antibiotics in pig production chains differentiated for the occurrence of PRRS (expressed as mg of active compound per kg of produced body weight).



Figure 3. Comparison of relative quantity of treated pig weight (weaning and fattening) in pig production chain differentiated for the occurrence of PRRS between 2017 and 2020.