

A new advisory tool to help practitioners reduce antibiotic consumption in pig herds

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Abstract

The present paper describes an advisory tool, Farm Facts, developed to assist veterinarians to reduce the consumption of antibiotics in pig herds. Farm Facts is a spreadsheet in three parts: The first part identifying the source of the main consumption in a herd, the second part giving a template for an action plan setting up a threshold for success, and the third part providing tables and graphs for follow-up according to the threshold after implementation of the action plan. Until now, Farm Facts has been used in herds for surveillance of results before and after implementation of vaccination programmes. As a typical example of successful reduction of antibiotic consumption, results from a Danish finishing herd implementing vaccination against ileitis are presented. The follow-up with Farm Facts in this herd showed that the use of antibiotics was reduced by 64%, while keeping the level of daily weight gain and reducing the mortality. Farm Facts is a useful tool for implementation of alternatives to antibiotics in pig herds and visualisation of results to veterinarians and pig producers.

Introduction

Antibiotic consumption in Danish pig production has close attention of the public. Though the antibiotic consumption is low compared to many other pig producing countries (1), political pressure is laid on the farmers to reduce the consumption. Recently, a threshold level for an acceptable number of daily doses (ADD) per pig was set by the authorities with the yellow card system. Herds with ADD/pig above the threshold level are forced to imply action plans to reduce their antibiotic consumption to avoid penalties.

The present paper describes Farm Facts; an advisory tool for veterinarians for creation and follow-up on action plans for reducing antibiotic consumption in pig herds. Farm Facts is provided as a spreadsheet and consists of three parts: Part 1 identifies the focus area (which treatment contributes the most to the total antibiotic consumption), part 2 creates an action plan to reduce the identified treatment, and part 3 allows to follow-up and to compare selected parameters before and after initiating the action plan. These three parts will be described thoroughly in the method section below. Furthermore an example with data from a specific pig herd will be given in the results section.

Methods

Part 1: Focus area

Part 1 is based on data from the central, password protected database on prescriptions to Danish production animals, Vetstat. Every single prescription made by a veterinarian in Denmark is registered in this database, basically telling who prescribed what, when, and to whom. The prescriptions are categorized according to the age group and the diagnosis (table 1). Farm Facts helps the veterinarian to extract the data from the herds they serve and to prepare visuals to be presented to the farmers. Based on a data extract from Vetstat, the spread sheet in part 1 of Farm Facts calculates the number of ADDs per produced pig for all pig herds in a veterinary practice. The histograms are based on the categorisation of the prescriptions according to age group and diagnosis. Each pig herd gets two histograms: One comparing their ADD/pig to other herds (fig 1), and another showing diagnoses and treatments of their particular herd. The histograms can be used in the veterinary advisory work to compare the use of antibiotics between herds. In herds with a relatively high consumption of antibiotics, the veterinarian and the farmer can then identify diagnoses and treatments responsible for the main part of the consumption.

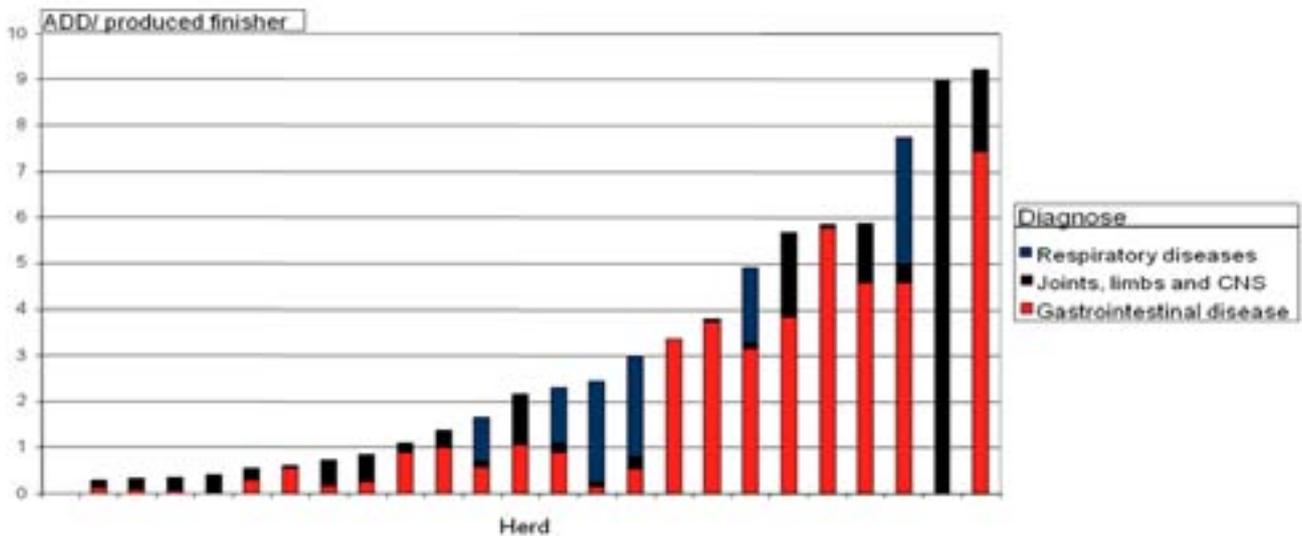


Fig. 1: Survey of use of antibiotics in herds served by one veterinarian.

Each pillar shows the total number of daily doses (ADD) prescribed per produced finishing pig in one particular herd. Used for identification of herds with a high consumption of antibiotics.

Part 2: Action plan

After the herds with a relatively high consumption of antibiotics are identified, the veterinarian and the farmer can develop an action plan for reduction. The spreadsheet in part 2 of Farm Facts contains a template for the action plan, formed as an agreement between veterinarian and farmer to reduce a particular part of the antibiotic consumption in the herd. The challenge for veterinarian and farmer is to select the preventive measures that will reduce the disease problems, which necessitates the use of antibiotics. Therefore, Farm Facts has a built-in drop-down menu with suggestions for alternative ways to reduce diseases, including management changes, feeding strategies and vaccination programmes. These suggestions are grouped according to age group of pigs and disease categories as defined in Vetstat. Using the template, each action plan is prepared specifically for one age group in the herd. The action plan has a pre-defined running period, to which the farmer should stick to in order to give the preventive measures time to work. However, because no farmer wants to take out the antibiotics and get diseased pigs or bad production figures as a result, the action plan also includes success criteria based on selected parameters. If these criteria for disease occurrence or production level are not met, the action plan should be re-evaluated. Again, Farm Facts has a drop-down menu with suggestions for disease and production parameters within the different age groups and diagnoses. The action plan is designed to fit one page, and it should be printed out and placed in the stable; easily accessible for everyone taking care of the pigs.

Table 1: Categorization of prescriptions for Danish veterinarians for registration in the Vetstat database on antibiotic consumption in pig herds.

Category	Code	Definition
Animal species	15	Pigs
Age group	55	Sows and piglets (mean 250 kg)
	56	Weaners (mean 15 kg)
	57	Finishers (mean 50 kg)
Disease	10	Reproduction/ urinary disorders
	11	Udder/MMA
	12	Gastro-intestinal diseases
	13	Respiratory diseases
	14	Joints, limbs and CNS
	15	Metabolism/circulation

Part 3: Follow up

As the farmer implements new preventive measures to reduce antibiotic consumption, part 3 in Farm Facts allows to analyse the development of important parameters of success. These parameters are recorded in regular intervals, chosen by the veterinarian and the farmer. Besides a drop-down menu with a choice of parameters within each age- and disease category, the spreadsheet contains a record table that will be sized according to the running period chosen for the action plan. Recordings can be made directly on a computer, or the sheet can be printed out. The key element in the follow-up is that the selected parameters need to be recorded both before and after the implementation of the action plan. The length of the interval should be constant over the whole recording period. In that way, there will be a sound basis for comparison. Some of the records might cause additional work, e.g. for counting coughs or greasy piglet tails, but this will benefit the pigs by creating more focus on the problems. The records can be shown in a graph, showing the mean for the parameter before and after implementation of the action plan in relation to the threshold level of success (example in fig. 3).

Results

Until now, Farm Facts has only been used for introduction of vaccination programmes, because vaccination is a straightforward and simple way to prevent diseases and thus reduce the need for treatment with antibiotics. The results from a finishing herd are presented as example below.

The herd is a conventional Danish pig herd producing finishers in weekly batches of 384 pigs, with a one-time-capacity of approximately 2300 pigs. Prophylactic medication with antibiotics is not used, but before the action plan, the herd had a steady consumption of oral tiamulin for treatment of diarrhoea. Besides these group medications, injectables were frequently used, and the mean total consumption for the 2300 pigs was 11.2 ADD per day. To reduce the use of antibiotics, a vaccination programme with oral vaccination against ileitis (Enterisol® Ileitis) was initiated. For 2 months after the initiation of the action plan, batch data on the mortality and the ADD (fig. 2) were recorded in the follow-up tables of Farm Facts. The threshold of success was an at least constant mortality and a reduction of antibiotics. The number of pigs delivered more than 13 weeks after entrance was recorded as a batch wise measure of slow growers.

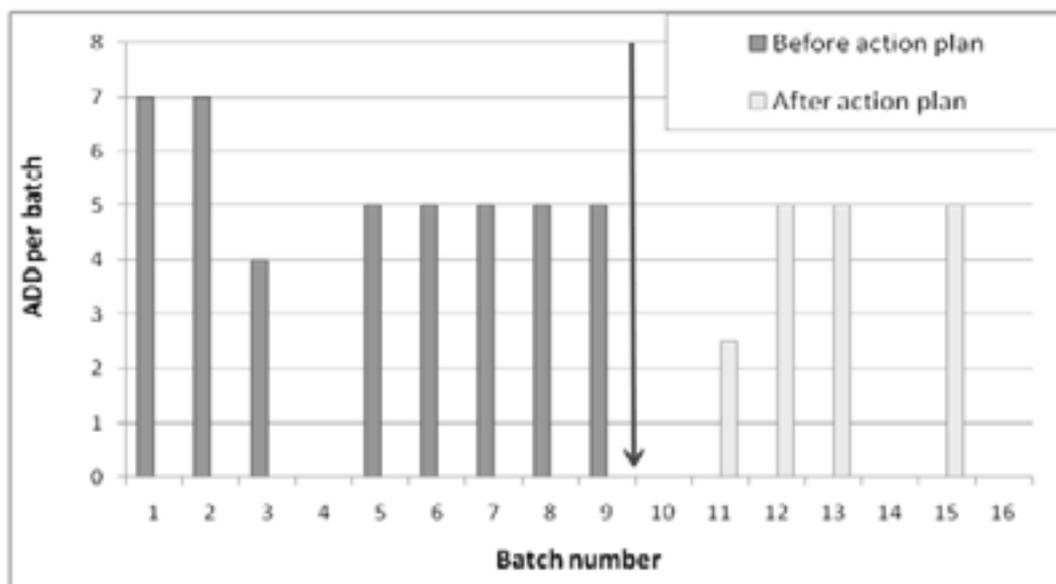


Fig. 2: Total consumption of antibiotics in a finishing herd before and after implementation of action plan (vaccination against ileitis). Arrow indicates the start of the action plan.

With vaccination, the mean total consumption of antibiotics was reduced by 64% to 40 ADD per day. Mortality decreased slightly (fig. 3), and the number of slow growers stayed constant. Despite the reduced use of antibiotics, the occurrence of clinical diarrhoea decreased as well. It is of special importance for the farmer, that ADDs used as injectables dropped by almost 50%, from 5.8 to 3.1 ADD/day. This contributed only a little to the total ADD, but allowed the farmer to save working time.

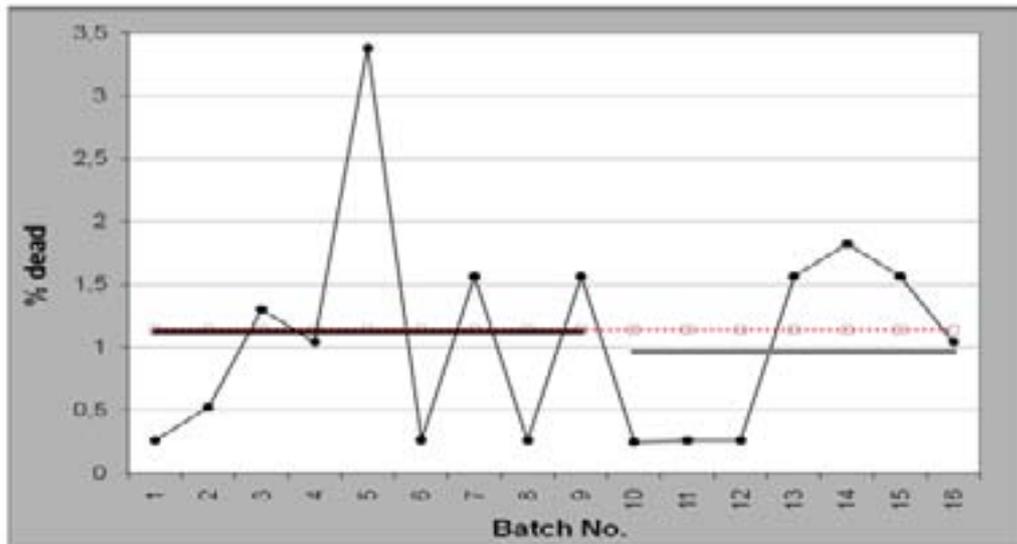


Fig. 3: Follow-up graph showing mortality before and after initiation of an action plan to reduce the use of antibiotics. The black line shows mean mortality before the action plan, where pigs were frequently medicated, and the grey line shows mean mortality after implementation of the action plan (vaccination with Enterisol® Ileitis) and a 64% reduction in antibiotic use.

Discussion

With the current focus on reduced use of antibiotics in the pig production, pig producers and veterinarians have to look more into preventive measures instead of treatment. Farm Facts provides a platform for initiation and follow-up on action plans for implementation of additional preventive measures, ranging from management changes to vaccinations. It is developed to be used on the farm, involving everyone taking care of the pigs. As such, it does not deliver complicated statistical calculations, but illustrates in a simple manner, if things are moving in the right direction. This was the case after the introduction of vaccination against ileitis in the example herd, where the vaccination reduced the antibiotic consumption significantly, as shown in many other herds (2, 3, 4).

Conclusion

The advisory tool Farm Facts delivers a helpful tool for initiation of vaccination programmes and other action plans in pig herds seeking to reduce the consumption of antibiotics.

References

1. Grave et al. (2010): Comparison of the sales of veterinary antibacterial agents between 10 European countries. *J Antimicrob Ther* June 29, 1-4
2. Bak, H. and Rathkjen, PH (2009): Reduced use of antimicrobials after vaccination of pigs against porcine proliferative enteropathy in a Danish SPF herd. *Acta Vet Scand* 51:1.
3. Adam, M. (2009): A Meta-analysis on field experiences with vaccination against ileitis showing a reduction in antibiotic use. *Proc. Safepork 2009, Quebec, Canada*, 171.
4. Nerem, J. (2009): *Lawsonia intracellularis* vaccination as an alternative to dietary antimicrobial medication in finishing swine. *Proc. Safepork 2009, Quebec, Canada*, 185.