Responsible use of antibiotics on pig farms (Part 2)

We are all striving to use less antibiotics to avoid AMR in human and animal health. To achieve this, it is important to improve everything that can have an influence on the health status of your farm: management, feed, water, housing, and biosecurity. It is not always easy to optimize these things and they can require a lot of efforts. If animals get sick, it is necessary to treat them for their welfare and recovery. To be successful with your antimicrobial treatment, it is important to know first what the reason of the illness can be. As discussed in the previous article, an accurate treatment starts with the observation of symptoms and analysis of the problems by a trustful diagnosis. By means of a bacteriological examination it's possible to detect the type of germ and the sensitivity. Both parameters will help the vet and the farmer to choose the right antibiotic. 'Gram-positive' and 'Gram-negative' are terms to classify bacteria based on the structure of their cell walls. (See fig.1)

Examples of Gram-negative bacteria are E. Coli, Salmonella, Proteus, Pasteurella. Examples of Gram-positive bacteria are Staphylococcus, Streptococcus, Clostridium. After the detection of the bacteria type, you can choose the right spectrum antibiotic. Some antibiotics have only a Gram-negative or a Gram-positive spectrum (narrow spectrum antibiotics) and some have both (broad spectrum antibiotics). For instance, antibiotics that interfere with the cell wall peptidoglycans are Beta lactam (e.g. Penicillin, Amoxycillin, Ampicillin) and cephalosporins (e.g. Ceftiofur). The bacteria will be killed by destroying the cell wall. These antibiotics are used to treat Gram-positive bacteria such as staphylococcus or streptococcus.

Fig. 1

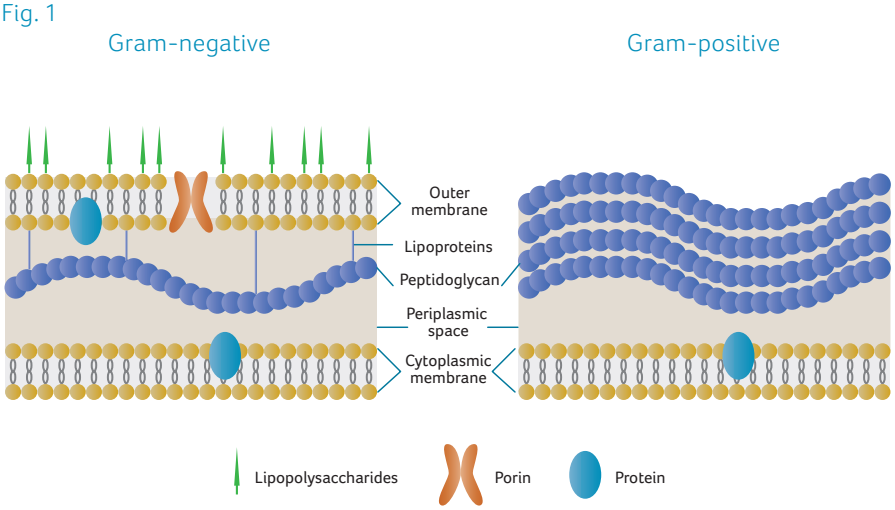
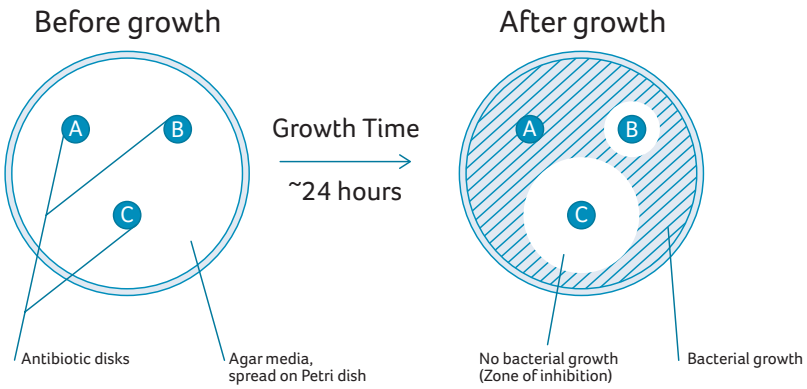


Fig. 2



Sensitivity analysis

The sensitivity analysis is a test that determines the "sensitivity" of a bacterium to an antibiotic. It also determines the ability of an antibiotic to kill or inhibit the bacteria.

The larger the zone of inhibition on the antibiotic disk, the more sensitive the bacterium is to this antibiotic. (See fig.2)

The veterinarian uses these test results to determine which antibiotics are likely to be most effective in treating the infection. (See fig.3)

Monitor the results during and after a treatment. If the treatment does not give the right result, change it after doing an extra examination or choose another antibiotic.

A bacterial disease can be caused by a single or by multiple germs. If a disease is caused by multiple germs, we call it a syndrome, e.g. swine respiratory disease syndrome. The treatment results of such syndrome can be poor because other pathogens as viruses and parasites will make the recovery more difficult. As described in precious article, antibiotics do not work against viruses and parasites.

Treatment protocol

To achieve good antimicrobial treatment results on a farm, start working with protocols.

In a proper farm health and treatment plan, different checklists are used by the vet to create an image of the problems on the farm. These checklists contain some points of attention, remarks and advices for these farm

Fig. 3 **Antibiotic sensitivity testing results**

Antibiotics	Pattern of tested bacteria reaction S	R	I	Total of tested organisms
Ciprofloxacin	95(95%)	02(2%)	03(3%)	100
Gentamycin	102(99.03%)	01(0.97%)	0(0%)	103
Norfloxacin	101(98.05%)	02(1.95%)	0(0.0%)	103
Kanamycin	84(81%)	11(10.5%)	10(9.5%)	105
Streptomycin	82(83.7%)	10(10.2%)	06(6.12%)	98
Novobiocin	72(69.2%)	24(23.1%)	08((7.7)	104
Tetracycline	63(60%)	24(22.9%)	18(17.1%)	105
Cefalexin	66(63.4%)	30(28.8%)	08(7.7)	104
Lincomycin	54(60.4%)	46(43.8%)	05(4.77%)	105
Amoxicillin	45(44.6%)	54(53.5%)	21.98%)	101
Penicillin –G	13(12.5%)	84(80.77%)	07(6.7%)	104

Key: (S) Sensitive, (I) Intermediate or (R) Resistance

specific problems. On this document you can also find proposed vaccination schedules, biosecurity measures, ventilation, housing, feed schedules and water management plans. Adapt these plans on a regular time depending on the problems.

In an antibiotic register, the farmer and the respective staff write down the antibiotics used. It contains a description of the group of treated animals, the number of treated animals, the name of antibiotic, the total dosage, the mode of administration, the withdrawal time and the treatment duration. (See fig. 4)

Combination therapy

If bacterial infections are accompanied by fever or pain always use a combination therapy with a NSAID (e.g. Kelaprofen 10%).

The results are better with a combination therapy of a NSAID with an antibiotic versus only an antibiotic.

(See fig. 5: MMA syndrome in sows: remark the significant difference in preweaning piglet mortality %)

Conclusion

Kela supports the responsible use of medicines. Our learning platform KelAcademy offers worldwide support to customers by providing different tools such as a farm dosage calculator, a biosecurity program 'Biocheck' in cooperation with the University of Ghent, Belgium and practical advice to increase the performance of farms. We can give you more information about these tools.

Interested? Please do not hesitate to contact us at info@kela.health.

Fig. 5 Preweaning piglet mortality (%)

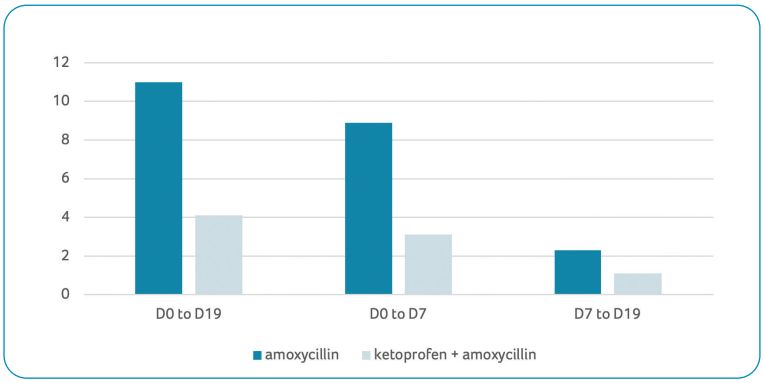


Fig. 4

ANTIBIOTIC REGISTER CATEGORY (e.g. sows, piglets or fattening pigs)						
Date	Number of treated animals	Name of antibiotic	Total dosage	Mode of administration	Withdrawal period	Treatment duration

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