Quantification of antimicrobial usage in farm animals: 

**ABcheck** a free online web application.

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**INTRODUCTION**

Acquiring detailed information on the extent of antimicrobial usage in a herd is of great importance to focus on a responsible and prudent use. In order to quantify the antimicrobial usage on pig, poultry and turkey farms an “antibiotic check” scoring system has been developed by the Veterinary Epidemiology Unit of the faculty of Veterinary Medicine, Ghent University. From June 2011 onwards this system is freely available online ([www.ABcheck.ugent.be](http://www.ABcheck.ugent.be)). The Dutch and English version are already operational, the French version is expected soon as well as a module for ruminants.

The ABcheck gives farmers, veterinarians and herd advisors the opportunity to calculate treatment incidences (TI) on a farm, using herd specific data. Results are subdivided into TI per animal category and can be recalculated to other usage quantification systems such as the Dutch daily dosage. Additional information is provided, for example if the antimicrobial is critically important according to the lists of World Health Organization (WHO)(¹) or World Organisation for Animal Health (OIE)(²).

**MATERIALS AND METHODS**

Calculation of the treatment incidences is based on the method of Timmerman et al.(³), using the Animal Daily Dose (ADD) or Used Daily Dose (UDD) and works with the formula:

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\text{Treatment incidence} = \frac{\text{Amount of antibiotics administered (mg)}}{\text{ADD or UDD (mg/kg) } \times \text{“at risk” (days) } \times \text{kg animal}} \times 1000
\]

The ABcheck calculator works totally anonymous, no login is required and the only information that needs to be provided by the farmer is the number of animals per production round, the type of product used, the used amount (milliliters, liters, grams, kg) and duration of treatment (see *Fout! Verwijzingsbron niet gevonden*). Herd specifics like production round duration and weight of the animals are prefilled, but can be adjusted.

Fig 1: example of input screen Abcheck.
The database behind the calculator consists of all antimicrobials registered in Belgium for the specific animal categories. For each antimicrobial the Animal Daily Dose (ADD) was established by taking the average dosage prescriptions from the medication’s leaflets. Factors for long acting antimicrobials were estimated from available scientific research papers. All used ADD’s can be found on the website.

RESULTS
The animal categories used for porcine herds are: sows, gilts and boars as one, suckling piglets and weaners apart and finishers as the third subcategory. Results for treatment incidences are also given in these three categories (see Figure 2).
This allows for pure multiplying or finisher herds to objectively compare with other herds. A total treatment incidence over a standardized duration of 205 days from birth until slaughter is also presented.

The ABcheck can be used for prophylactic and curative (including metaphylactic) treatments. The percentage for each is given as a part of total TI in the results. ABcheck also mentions what percentage of antimicrobials used belong to the critically important list of WHO or OIE. If wanted, scores can be saved and recovered after registration. The farmer can see the benchmarking of his herd versus other farms in the database. Recently these graphs are restyled so that they display both the magnitude of prophylactic as well as curative usage for the reproduction animals, the suckling piglets and weaners, and the finishers separately.

At the moment data from 15 reproduction herds, 64 herds with piglets and 31 herds with finishers, 47 broiler flocks and one turkey flock are in the database. The database is dynamic and newly saved data are added directly into the graphs. The graphs show a wide variety in antimicrobial usage amongst pig herds and poultry flocks in Belgium, with treatment incidences from zero to almost 1800 for suckling piglets and weaners, zero to 467 for finishers and zero to 107 for reproduction pig herds. Recalculated to a standardized lifespan of 205 days (birth until slaughter) the slaughter pigs have an average treatment incidence of 158 (min. 0, max 912). For broiler flocks the treatment incidences are from around 50 minimum to 500 maximum.

Figure 2 Graph of the herds with suckling piglets and weaners so far in the database of ABcheck. Both prophylactic and curative usage are displayed. After registration the score from the herd will be shown by an arrow, benchmarking the herd versus the other farms in the database.

DISCUSSION
In order to guarantee the accessibility the ABcheck calculator should be an easy filling in tool, it might still be filled in differently by different users. Clear explanations on the website are given to maximize the correct use of the ABcheck calculator. The used ADD’s are based on average registration doses. In the future it might be interesting to add factors for potency or critically importance. But as the correct values per antimicrobial or antimicrobial class are momentarily a worldwide subject of discussion, we chose to keep it as transparent as possible. Necessary and consented updates can be done easily in the future. Information on the website will be updated regularly.

CONCLUSION
The ABcheck has been viewed in over 20 different countries and gets a lot of interest from diverse people. It offers a tool that is highly asked for in the world due to the ongoing discussion on antimicrobial usage and resistance in animals and humans. The results so far show a wide variety in antimicrobial usage between farms, which might give a positive impulse to the higher users to reduce the use of antimicrobials on their herds. The ABcheck offers a free and easy to use tool to measure antimicrobial usage, giving a complete overview on the extent of antimicrobial usage on farm level. Evaluating and following up the results can provide “food” for discussion and improvement on farm level!

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REFERENCES
OIE, *List of Antimicrobials of Veterinary Importance*, May 2007