

# Newsletter

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## NEWS

### First sampling campaign launched!

On 19 September 2014, the EFFORT project coordinator officially launched the first full scale EFFORT sampling campaign. Protocols, tailored for EFFORT and tested during a small pilot study during summer, have been distributed to all partners performing sampling. They are accompanied by information sheets for the samplers and the participating farmers and study volunteers.

**EFFORT annual meeting: 7-9 January 2015, Madrid, Spain**

## A WORD FROM THE PROJECT COORDINATOR

Welcome to the EFFORT newsletter. This is the first edition and comes after the project has been underway for almost 11 months. In the first year of the project the sampling in all countries will start and therefore in the past few months we have been working on harmonisation and finalisation of all sampling protocols, questionnaires and the information for participants. Furthermore the protocols for analysing antimicrobial resistance in fecal samples from different animals species were optimised and we classified the biophysical parameters which affect gene transfer in the food chain. The samples we collect are the backbone of the project and are crucial for the quality of the next analysis steps and the quality of the outcomes of EFFORT.

This newsletter will focus on those achievements and explain some of the protocols used in this project. You can find a short summary of what has been done in each work package. We will also describe some of the plans for the next year. We hope that you will find it useful and we do encourage you to get in touch with any questions or comments you may have about what EFFORT is doing!

Your comments and suggestions are always welcome - please email them to [effort-office@eurtd.com](mailto:effort-office@eurtd.com), join our [LinkedIn group](#) or follow us on [Twitter](#).



Thanks for your interest in the EFFORT project!

Prof. Dr Jaap Wagenaar, EFFORT project coordinator

## ABOUT EFFORT



The introduction of antimicrobials in human medicine completely changed the options for treatment. However, the benefits of their discovery

were soon hampered as their use invariably leads to antimicrobial resistance (AMR). Although a number of steps have been taken to address and reduce the emergence and spread of AMR over the last decades, its continuous increase indicates that current control measures such as the ban on antimicrobial growth promoters or regional and national awareness campaigns had limited success.

The EFFORT project has the following four main objectives:

- Understanding the epidemiology of antimicrobial resistance in the food chain;
- Understanding the ecology of antimicrobial resistance in the microbial communities;
- Understanding the relative contribution of the exposure route of antimicrobial resistance from animals to humans;
- Understanding the economic impact and animal welfare aspects of antimicrobial resistance in the food chain.

Through its results, the EFFORT project will provide scientific evidence and high quality data that will inform decision-makers, the scientific community and other stakeholders about the consequences of AMR in the food chain, in relation to animal health and welfare, food safety and economic aspects. These results can be used to support decisions and to prioritise risk management options along the food chain.

### Work package 1 Integrated evidence base for the food chain

The sampling protocol developed in work package 1 (WP1) aims to standardise sample and data collection along diverse food chains in different countries. The samples and data obtained in WP1 will facilitate further analysis and comparison across food systems. During a very fruitful training session in Brussels on 5-6 June 2014, project members of all partners involved in WP1 collaborated to harmonise and finalise all sampling protocols, questionnaires and information for participants. This set the basis for harmonised recruitment of farms and data collection.

### Work package 3 Ecology and transfer of resistance mechanisms

WP3 aims to identify and characterise food-chain parameters that influence the rate of genetic exchange between bacteria, bacterial fitness and expression of antimicrobial resistance determinants, as well as experimentally prevalent clones, mobile genetic elements and antimicrobial resistance genes present in the food chain in Europe, and assess their potential epidemic spread in human-adapted bacterial hosts. The goal is to assess the stability, fitness, and propagation characteristics of the prevalent mobile genetic elements, and determine the conditions that determine their spread and propagation in the food chain.

### EFFORT AT A GLANCE

Total Budget: € 9,000,000

Consortium: 20 partners

Countries: 10

Duration: 1 Dec 2013 - 30 Nov 2018

### Work package 2

#### Molecular approaches for determining the molecular ecology and epidemiology of antimicrobial resistance genes

A protocol for extracting DNA from fecal samples has been delivered. The delivery was slightly delayed, as the kit the initial protocol was based on, went off the market. A new kit was examined, and has been implemented in the protocol instead. The protocol has been selected based on various quality-criteria e.g. yield, stability, and sequencing-results.

An [online analytic pipeline](#) for quantification of all known antimicrobial resistance genes in meta-genomic samples has been established and is currently being benchmarked. So far the performance is promising, but minor adjustments in settings might be needed. Integrating the pipeline with the data storage is proceeding as planned and the final web based analytic tool is expected to be delivered on time.



## Work package 4

### Epidemiological analysis of antimicrobial resistance patterns in humans and the environment

The first task for WP4 is the creation of the database with all data collected as part of WP1 and WP2. By combining information from the field studies, the metagenomic data and later the quantitative polymerase chain reaction (qPCR) data on selected targets, the work package will facilitate analysis of associations between determinants on the farm or country level and microbial resistance. The data created in WP1 will become available as a downloadable dataset which will contain species specific results across all countries. A discussion is going on with some partners, on how results obtained from the analysis of the metagenomic data has to be combined with the meta-data. More detailed information about the data flows and how these will become available for consortium members will be released very soon.

## Work package 5

### Relationship between farming practices, antimicrobial usage, animal health and resistance

A series of questionnaires have been developed, along with sampling protocols, to standardise the data collection for the descriptive study.

The questionnaires for pigs, poultry, veal calves, turkeys and aquaculture-fish encompass five main sections: general information, technical data, biosecurity check, antimicrobial usage and welfare indicators.

Attention has been paid in order to minimise the time-burden for the farmers who will participate in the study: the sections have been designed to get as much information with as few questions as possible. Furthermore, questions have been marked to indicate whether they can be filled in before the visit, or during a farm tour either based on own observations or based on the farmers replies.

For wildlife, the questionnaire covers only general questions, while for companion animals the questionnaire contains general questions and questions on antimicrobial usage and daily habits (food, animal contacts, environment, etc.).

Manuals accompanying the questionnaires have also been established; these explain how to use the questionnaires and specify the information that the different questions need to deliver. To increase the level of standardisation between the participating countries a training session was organised on 5-6 June 2014, aimed directly to the personnel that will be involved in the farm visits. In this session, each aspect of the farm visit, including the sampling process and the use of the questionnaire, was discussed in detail.



EFFORT (Ecology from Farm to Fork Of microbial drug Resistance and Transmission) is supported by the European Commission under the Food, Agriculture and Fisheries, and Biotechnologies theme of the 7<sup>th</sup> Framework Programme for Research and Technological Development (Grant Agreement no 613754).





## Work package 6

### Intervention studies aiming at reducing antimicrobial usage and resistance in pig and poultry production

A review of the literature about interventions on antimicrobial usage in pig and poultry farm was started and is on-going. Two meetings were organised at Maisons-Alfort (3-4 June 2014, 8-9 September 2014) to discuss:

- 1) the principles of the veterinary intervention in pig and poultry farms, the main indicators of effect on antimicrobial usage, animal welfare and economical results and
- 2) to start the design of the audit and decision tool which will be applied by veterinarians and used to collect data.

## Work package 8

### Economic impact analysis

Currently the literature and conceptual aspects of the economic impact issues are being elaborated. This task is expected to be completed by January 2015. The members of this work package are also working on a calculation model to evaluate economic and technical impact of antibiotics use.

A stakeholder panel for economics has been established and its first meeting is scheduled for beginning of November 2014.

## Work package 7

### Quantification of exposure to antimicrobial resistance through different transmission routes from animals to humans

The Technical University of Denmark (DTU) applied for a Med-Vet-Net grant for a short term mission at the Universidad Complutense in Madrid, with the aim of fostering the collaboration between WP7 and WP3. The mission is scheduled for February 2015 and will enforce a successful collaboration between researchers of different disciplines, which is often a challenge in a multidisciplinary project like EFFORT. A visit of a risk assessor to a molecular microbiology centre will not only contribute to the overall success of the EFFORT project, but will also represent an important step towards the success of transdisciplinary communication.

## Work package 9

### Project dissemination and training

The [project website](#) has been developed. It presents a wide range of information related with the different project activities, participants, etc. A video of the project coordinator (Prof. Jaap Wagenaar, Utrecht University) is also there, welcoming your visit!

Please also take the opportunity to follow us on [Twitter](#), and join our [LinkedIn group](#).

We have also developed a flyer and a poster that you are most welcome to download, print and disseminate. They can be found [here](#).

Presentations about the project have been made at the European Medicines Agency, Committee for Medicinal Products for Veterinary Use Antimicrobials Working Party Nordic (London, 22 January 2014) and on the Nordic One Health Conference (Friebergh, Sweden, 19 March 2014).

Several upcoming dissemination activities are planned, so if you are interested, please contact Dr Jorge Pinto Ferreira, at [jorge.pinto-ferreira@safoso.ch](mailto:jorge.pinto-ferreira@safoso.ch), and we will be happy to add you to our stakeholders list.



PROJECT PARTNERS



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## PROJECT PARTNERS

The EFFORT consortium is made up of 20 partners from 10 different European countries (see map below): Belgium, Bulgaria, Denmark, France, Germany, Italy, the Netherlands, Poland, Spain and Switzerland. The work packages are led by key European experts with extensive research experience in the fields of veterinary medicine and agricultural sciences and in the specific fields of antimicrobial use and resistance. They are well qualified and have published an abundance of articles about the micro- and macro-epidemiology of antimicrobial resistance and related issue in peer reviewed journals. The participants have been and currently are heavily involved in European and global political and scientific initiatives aiming at surveillance and control of antimicrobial resistance based on ecological and epidemiological scientific knowledge.



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