



**DISCONTTOOLS**

## **Prioritising research to control animal diseases more effective**

The DISCONTTOOLS initiative





## Summary

DISCONTTOOLS, an ongoing EU funded project, has three objectives. Firstly, to develop a disease prioritisation methodology enabling the prioritisation of research in order to stimulate the delivery of new or improved diagnostics, vaccines or pharmaceuticals. This will help to improve our ability to effectively control animal diseases which is a key input into meeting the challenges of future food supplies. Once this methodology is agreed with stakeholders, the objective is to establish a reference database ensuring a clear focus on priority research areas leading to more rapid breakthroughs in technology development. Secondly, to develop a gap analysis for each of the prioritised disease to identify where research is needed. Thirdly, the DISCONTTOOLS project will explore how new technologies can be deployed more efficiently in the animal health research area.

## Background

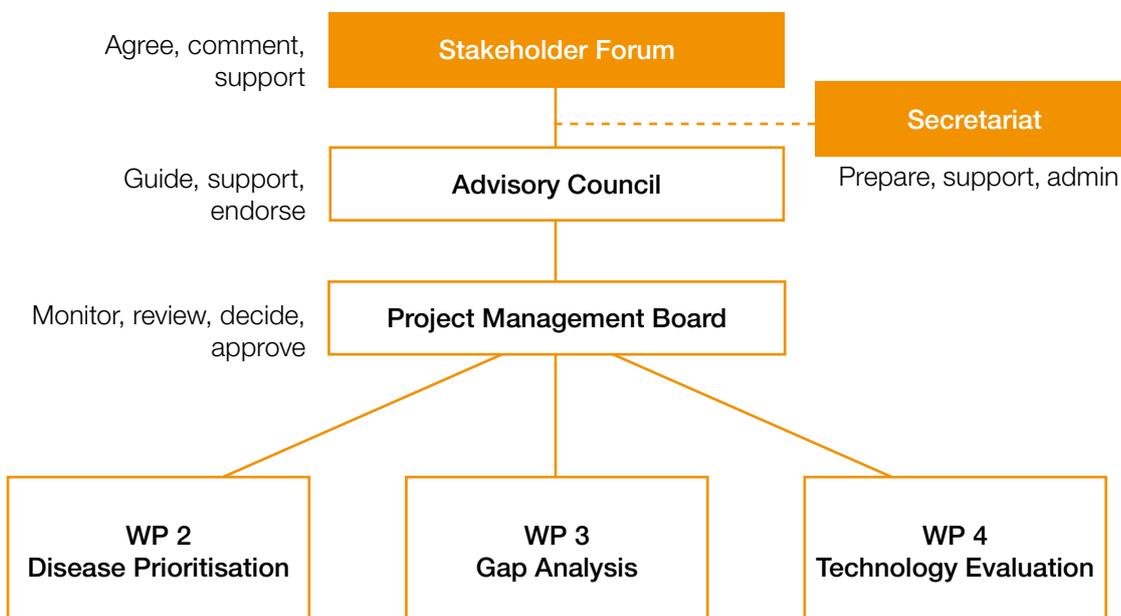
The DISCONTTOOLS project ([www.discontools.eu](http://www.discontools.eu)), led by IFAH-Europe, originated from the Action Plan of the European Technology Platform for Global Animal Health (ETPGAH) ([www.etpgah.eu](http://www.etpgah.eu)) where it was recognised that disease prioritisation was one of the most important initiatives that needed to be undertaken to focus and prioritise research. The 4-year project started in 2008 and will stimulate the delivery of new or improved diagnostics, vaccines or pharmaceuticals in order to improve our ability to control animal diseases. A further objective is to ensure the deployment of new technologies in the animal health area as rapidly as possible by developing a blueprint for the identification and evaluation of new technologies.

## Stakeholders

DISCONTTOOLS, just like the ETPGAH, is unique in that it is stakeholder driven. It includes representatives from the universities, research institutes, chief veterinary officers, farmers, vets, diagnostics industry, veterinary pharmaceutical industry, Heads of Medicines Agencies, European Medicines Agency and the OIE amongst others. The purpose of the stakeholder approach is to be inclusive and so build a strong consensus on the gap analysis.

## Structure

In order to carry out the work, 5 Work Packages (WP) were established under a simple governance structure as in Figure 1:



The Project Management Board (PMB) takes care of WP 1 and 5 in terms of overall management and communication.

WP 2 is responsible for building a disease prioritisation model, for prioritising research and for the development of the website to make this information publicly available. Concerning the model, it has been necessary to review existing models and identify the criteria that should be considered including scoring and weighting. Following this review, we developed our prioritisation model as per Annex 1. In order to support the decision making process, it has been necessary to collate relevant evidence (referred to as Disease and Product analysis – sample page in Annex 2) in relation to each disease related to each of the criteria in the prioritisation model. This evidence has been gathered by creating an Expert Group for each of the 51 diseases within the DISCONTTOOLS scope – diseases listed in Annex 3. In order to assist all parties concerned, an interpretation guide has been developed to assist scoring – see sample page in Annex 4.

The model is now available on the website where everybody is invited to submit comments electronically. From time to time, the comments will be evaluated by the relevant Expert Group ensuring that the information remains up to date over time.

WP 3 is responsible for developing criteria and a methodology for gap analysis. The Disease and Product analysis information again helps to provide the evidence necessary to identify where research is needed with a specific column dedicated to capturing relevant gaps. WP 3 also developed a gap analysis scoring model for diagnostics, vaccines and pharmaceuticals – see Annex 5. This analysis is particularly important when identifying the most important gaps and assists in scoring the control tools section of the prioritisation model. Again, an interpretation guide has been developed to assist in scoring in gap analysis.

In terms of approval processes, the Expert Group opinions are reviewed by WP 2 & 3 and then referred to the PMB for final approval before placing data on the public website.

In the work of WP 4 on technology evaluation, current methods used by various industries have been evaluated with a view to identifying best practice. A review of this work has been published on the website. Having carried out this exercise, the WP is now developing a blueprint for use in the animal health sector and the objective is to 'road test' this model and publish the results on the website. Literature searches, workshops, conferences, patent evaluations along with the development of networks are just some of the concepts under evaluation. The outcome should be a methodology to ensure the deployment of new technology in the animal health research area in a more efficient manner in the future.

## Results

To date, 12 sets of disease information have been placed on the public website ([www.discontools.eu](http://www.discontools.eu)). Expert Groups have completed their work in relation to an additional 18 diseases and this information is going through the approval process. It is anticipated that the majority of Expert Groups will have completed their work by the end of June, 2011.

In examining the results, it has become clear that the information is quite complex and so we are developing an Interpretation Guide that will be placed on the website to clarify the use of the results. In addition, each disease will be accompanied by a short summary of the main findings assisting all concerned in interpreting the data.

## Reference Database

As the database is populated with the 51 diseases and as we receive input through the public website, the data on the website will become quite definitive in terms of the state of play concerning research prioritisation focused on delivering new and improved diagnostics, vaccines and pharmaceuticals. In addition, as the model matures, we can then move on to a new phase of adding further diseases. Via the ongoing consultation process, the model will remain up to date and prioritisation will change over time as gaps are filled and as new information becomes available including on emerging and re-emerging diseases.

Our wish is to create a definitive source of data on prioritisation of research in the field of animal diseases, driven by stakeholders, that will facilitate public and private funders in determining the most efficient way of deploying research funding.

Our thanks to DG Research of the European Commission for providing funding for both the ETPGAH and DISCONTTOOLS projects.

## Annex 1: Prioritisation model

### DISCONTTOOLS SCORING MODEL

#### “Prioritising research into new or improved tools”

| Criteria  | Scores |    |   |    |    | Coef  | Total<br>(score*coef) |
|---|--------|----|---|----|----|-------|-----------------------|
|   | 0      | 1  | 2 | 3  | 4  |       |                       |
| <b>Disease knowledge</b>  | 0      | 1  | 2 | 3  | 4  |       | /100                  |
| 1. Speed of spread  |        |    |   |    |    | 2.5   |                       |
| 2. Score for number of species involved   |        |    |   |    |    | 2.5   |                       |
| 3. Persistence of infectious agent in the environment   |        |    |   |    |    | 2.5   |                       |
| 4. Risk of spread to susceptible populations  |        |    |   |    |    | 2.5   |                       |
| 5. Potential for silent spread  |        |    |   |    |    | 2.5   |                       |
| 6. Wildlife reservoir and potential spread  |        |    |   |    |    | 2.5   |                       |
| 7. Vector reservoir and potential spread  |        |    |   |    |    | 2.5   |                       |
| 8. Variability of the agent   |        |    |   |    |    | 2.5   |                       |
| 9. Understanding of fundamental immunology  |        |    |   |    |    | 2.5   |                       |
| 10. Host pathogen interaction   |        |    |   |    |    | 2.5   |                       |
| <b>Impact on animal health and welfare</b>  | 0      | 1  | 2 | 3  | 4  |       | /100                  |
| 1. Disease impact on production   |        |    |   |    |    | 8.33  |                       |
| 2. Duration of animal welfare impact  |        |    |   |    |    | 8.33  |                       |
| 3. Proportion of animals affected suffering pain/injury/<br>distress as a result of the disease |        |    |   |    |    | 8.33  |                       |
| <b>Impact on public health – human health</b>   | 0      | 1  | 2 | 3  | 4  |       | /100                  |
| 1. Impact of occurrence on human health   |        |    |   |    |    | 4.16  |                       |
| 2. Likelihood of occurrence   |        |    |   |    |    | 4.16  |                       |
| 3. Impact of occurrence on food safety  |        |    |   |    |    | 4.16  |                       |
| 4. Transmissibility (spread from animals to humans)   |        |    |   |    |    | 4.16  |                       |
| 5. Spread in humans   |        |    |   |    |    | 4.16  |                       |
| 6. Bioterrorism potential   |        |    |   |    |    | 4.16  |                       |
| <b>Impact on wider society</b>  | 0      | 1  | 2 | 3  | 4  |       | /100                  |
| 1. Economic direct impact (including cumulative cost<br>(e.g. Enzootic vs. epizootic)           |        |    |   |    |    | 8.33  |                       |
| 2. Economic indirect impact (social, market)  |        |    |   |    |    | 8.33  |                       |
| 3. Agriterrorism potential  |        |    |   |    |    | 8.33  |                       |
| <b>Impact on trade</b>  | 0      | 1  | 2 | 3  | 4  |       | /100                  |
| 1. Impact on international trade due to existing regulations                                    |        |    |   |    |    | 6.25  |                       |
| 2. Impact on EC trade due to existing regulations   |        |    |   |    |    | 6.25  |                       |
| 3. Potential for regionalisation  |        |    |   |    |    | 6.25  |                       |
| 4. Impact on security of food supply  |        |    |   |    |    | 6.25  |                       |
| <b>Control tools</b>  | +2     | +1 | 0 | -1 | -2 |       | /100                  |
| 1. Appropriate diagnostics  |        |    |   |    |    | 16.66 |                       |
| 2. Appropriate vaccines   |        |    |   |    |    | 16.66 |                       |
| 3. Appropriate pharmaceuticals  |        |    |   |    |    | 16.66 |                       |
| <b>Total score</b>  |        |    |   |    |    |       |                       |

## Annex 2

# DISEASE AND PRODUCT ANALYSIS

## “Prioritising research into new or improved tools”

Disease: .....

Revised 30 November 2010

PART 1: CONTROL TOOLS

| Product analysis  | Current knowledge | Gap(s) in availability of products/knowledge |
|---|-------------------|--|
| Part 1 Control tools  |                   |  |
| 1 Diagnostics availability  |                   |  |
| 1.1. Commercial diagnostic kits available worldwide<br><i>Host/Pathogen</i>   |                   |  |
| 1.2. Commercial diagnostic kits available in Europe<br><i>Host/Pathogen</i>   |                   |  |
| 1.3. Diagnostic kits validated by International Standards (OIE) or European Standards (EU) or National Standards      |                   |  |
| 1.4. Diagnostic method(s) described by International Standards (OIE) or European Standards (EU) or National Standards |                   |  |
| 1.5. Commercial potential for diagnostic kits in Europe   |                   |  |
| 1.6. DIVA tests required and/or available   |                   |  |
| <i>Intended for eradication of disease or economic control of disease/need and nature of the desired DIVA test</i>    |                   |  |

## Annex 3

# DISCONTTOOLS LIST OF 51 DISEASES

### Group 1: Epizootic diseases

- African Horse Sickness
- African Swine Fever
- Avian Influenza
- Bluetongue
- Contagious Bovine Pleuro Pneumonia
- Classical Swine Fever
- Foot & Mouth Disease
- Peste des Petits Ruminants
- Rift Valley Fever
- Sheep and Goat Pox
- Swine Vesicular Disease
- West-Nile Virus infection
- Zoonotic pox viruses (Parapox and Orthopox)

### Group 2: Zoonotic diseases

- Rabies
- Nipah virus infection
- Anthrax
- Brucellosis
- Bovine Tuberculosis
- Q Fever
- Trypanosomiasis
- Leishmaniasis
- Leptospirosis
- Chlamydiosis
- Cysticercosis
- Echinococcosis
- Food-borne bacterial:
  - Salmonella
  - E. Coli
  - Campylobacter
- Cryptosporidiosis
- Food-borne viral (Hepatitis E. Virus)
- Bovine Spongiform Encephalopathies
- Crimean Congo Haemorrhagic Fever

### Group 3: Major food-producing animal disease complexes

- Paratuberculosis (Johne's)
- Parasitic gastro-intestinal diseases:
  - Liver Fluke
  - Coccidiosis
  - Nematodes
- Mastitis:
  - Staphylococcus aureus mastitis
  - Environmental/Streptococcal mastitis
  - Small ruminant mastitis
- Swine respiratory:
  - PRRS – CG3 + HN
  - PCV II
  - SIV
  - A. Pleuropneumonia
  - Swine Mycoplasma
- Bovine respiratory:
  - BVDV
  - BRSV
  - BHV-1 (IBR)
- Mycoplasma bovis
- Theileria

## Annex 4: Sample page – Interpretation guide for prioritisation

# DISEASE SCORING MODEL FOR PRIORITISATION

## Interpretation guide

Revised 3 March 2011

“Prioritising research into new or improved tools”

|               | <b>Criteria</b>                                       |                                      |   |  |
|---------------|---|--------------------------------------|---|--|
| <b>Source</b> | <b>Disease knowledge</b>                              | <b>0</b>                             | <b>1</b>  |  |
| Defra<br>AP   | 1. Speed of spread                                    | None<br>Non transmissible            | Very slow<br>Low level of transmission within holdings and unlikely between holdings  |  |
| CVO<br>AP     | 2. Score for number of species involved               | One                                  | ND expected to be limited   |  |
| CVO<br>AP     | 3. Persistence of infectious agent in the environment | No never found                       | Rare occasionally found   |  |
| CVO<br>AP     | 4. Risk of spread to susceptible populations          | No<br>Not contagious                 | Low<br>Transmissible direct contact   |  |
| WG<br>Defra   | 5. Potential for silent spread                        | None                                 | Negligible<br>Signs of infection easily recognised and likely to occur in animals under supervision                           |  |
| WG<br>Defra   | 6. Wildlife reservoir and potential spread            | None<br>No known wildlife reservoir  | Minor<br>Prevalence in remote wildlife  |  |
| CVO<br>AP     | 7. Vectors reservoir and potential spread             | None<br>No known vector or reservoir | Low<br>Competent vector(s) thought to exist in the country but not considered capable of surviving and transmitting infection |  |

| Scores  |   |  | Coef | Total |
|---|---|--|------|-------|
| 2   | 3   | 4  | 2.5  | /100  |
| Slow<br>Slow transmission between holdings with or without animal movements   | Medium<br>Rapid transmissions between holdings with or without animal movements                                       | High<br>Rapid transmission between holdings without animal movements   |      |       |
| Limited 2 species   | Medium 3 species  | High 4 species and over  |      |       |
| ND if unknown   | Constant animal reservoir or vector   | Not removable from the environment   |      |       |
| ND if unknown medium  | Medium<br>Indirect contact, contagion   | High airborne infection  |      |       |
| Low<br>Signs of infection easily recognised but depends on the level of supervision                                   | Moderate<br>Specific diagnosis may be difficult in one or more species  | High<br>Disease/infection not likely to be detected for some time  |      |       |
| Moderate<br>Wildlife reservoir: no direct contact with humans or domestic animals                                     | Significant<br>Wildlife reservoir   | Serious<br>Wildlife reservoir in close contact with humans and/or domestic animals                           |      |       |
| Medium<br>Competent vector(s) exist in the country but not considered capable of surviving and transmitting infection | High<br>Competent vector(s) exist in the country but not considered capable of surviving but could transmit infection | Very high<br>Competent vector(s) exist in the country and is capable of surviving and transmitting infection |      |       |

## Annex 5: Gap analysis model

# DISCONTOOLS PRODUCT GAP ANALYSIS “Prioritising research into new or improved tools”

| Criteria   | Scores |    |   |    |    | Coef | Total |
|--|--------|----|---|----|----|------|-------|
|  | +2     | +1 | 0 | -1 | -2 |      |       |
| Diagnostic tools   |        |    |   |    |    |      | /100  |
| 1. Availability*   |        |    |   |    |    | 4.55 |       |
| 2. Prevention and control - Differentiation of infected from vaccinated (DIVA) |        |    |   |    |    | 4.55 |       |
| 3. Strategic reserve   |        |    |   |    |    | 4.55 |       |
| 4. Capacity of production  |        |    |   |    |    | 4.55 |       |
| 5. Affordable  |        |    |   |    |    | 4.55 |       |
| 6. Quality/stability/durability  |        |    |   |    |    | 4.55 |       |
| 7. Sensitivity   |        |    |   |    |    | 4.55 |       |
| 8. Specificity   |        |    |   |    |    | 4.55 |       |
| 9. Reproducibility   |        |    |   |    |    | 4.55 |       |
| 10. Simplicity/ease of use   |        |    |   |    |    | 4.55 |       |
| 11. Speed  |        |    |   |    |    | 4.55 |       |

| Criteria   | Scores |    |   |    |    | Coef | Total |
|--|--------|----|---|----|----|------|-------|
|  | +2     | +1 | 0 | -1 | -2 |      |       |
| Vaccination tools                                      |        |    |   |    |    |      | /100  |
| 1. Commercial availability*                            |        |    |   |    |    | 5.00 |       |
| 2. Monitoring for infection in a vaccinated population |        |    |   |    |    | 5.00 |       |
| 3. Strategic reserve                                   |        |    |   |    |    | 5.00 |       |
| 4. Capacity of production                              |        |    |   |    |    | 5.00 |       |
| 5. Affordable  |        |    |   |    |    | 5.00 |       |
| 6. Quality/stability                                   |        |    |   |    |    | 5.00 |       |
| 7. Safety of vaccines                                  |        |    |   |    |    | 5.00 |       |
| 8. Efficacy  |        |    |   |    |    | 5.00 |       |
| 9. Immunity  |        |    |   |    |    | 5.00 |       |
| 10. Convenience of use                                 |        |    |   |    |    | 5.00 |       |

\* if score is +2, please only answer question 1 on “Availability” (as there is a gap in product). If no product exists, a weight of +20 on the availability criteria shall be applied.

| Criteria                         | Scores |    |   |    |    | Coef | Total |
|----------------------------------|--------|----|---|----|----|------|-------|
|                                  | +2     | +1 | 0 | -1 | -2 |      |       |
| Pharmaceutical tools             |        |    |   |    |    |      | /100  |
| 1. Availability*                 |        |    |   |    |    | 5.00 |       |
| 2. Prevention and control        |        |    |   |    |    | 5.00 |       |
| 3. Strategic reserve             |        |    |   |    |    | 5.00 |       |
| 4. Capacity of production        |        |    |   |    |    | 5.00 |       |
| 5. Cost                          |        |    |   |    |    | 5.00 |       |
| 6. Quality                       |        |    |   |    |    | 5.00 |       |
| 7. Safety animal                 |        |    |   |    |    | 5.00 |       |
| 8. Safety consumer/user concerns |        |    |   |    |    | 5.00 |       |
| 9. Safety environment            |        |    |   |    |    | 5.00 |       |
| 10. Resistance                   |        |    |   |    |    | 5.00 |       |

\* if score is +2, please only answer question 1 on "Availability" (as there is a gap in product). If no product exists, a weight of +20 on the availability criteria shall be applied.

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