

Innovative information systems enabling public research organizations and the livestock industry in France to share animal health resources and skills

Marie-Colette FAURÉ¹, Etienne ZUNDEL²

1. INRA, UAR 564 DSA, 24 chemin Borde Rouge, BP 52627, F-31326 Castanet-Tolosan Cedex, France, Marie-Colette.Faure@toulouse.inra.fr

2. INRA, UAR 564 DSA, F-37380 Nouzilly, France

Abstract

The Animal Health Division (AHD) of INRA (French National Institute for Agricultural Research) uses information about animal health and veterinary public health as a tool in its overall strategy, and it has developed an innovative current awareness system, obtaining reliable information through networks. The AHD works on issues lying at the heart of public concerns about animal health and veterinary public health, fostering organised and continuous links with the livestock production industry in France. As part of the socio-professional partnership, the AHD has set up systems for strategic guidance and collaborative tools on the Internet, including CERISA, the Animal Health and Veterinary Public Health Portal, and VeliSA – French language current awareness and literature search. CERISA: This carefully targeted portal is the main gateway to resources and skills in the field of animal health and veterinary public health in France: selected animal health resources; operational mapping of the veterinary public health arena in France, showing the stakeholders and areas involved, pathological entities and production chains; a "partner space" for the development of collaboration between stakeholders. www.sante-animale.eu VeliSA: this intelligence system collects information on animal health from articles published in the professional press and specialized scientific and technical seminars. The information is stored in a database, which can be accessed on the Internet and which contains articles from more than 40 journals with proceedings of symposia dating back to 2000. www.toulouse.inra.fr/velisa. These information systems require the development of original tools based on the latest web technology (RSS feeds, geolocation, etc.). The current systems involve a new way of managing information with the emphasis on quality: available data are consolidated, put into context, interlinked, classified (by key words, fields of competence or themes). They are invaluable tools for providing animal health reference material, highlighting the Division's expertise, and providing useful information in the field.

Keywords: animal health, veterinary public health, information, portal, current awareness system

Résumé

Un dispositif de veille innovant pour partager les ressources et les compétences en santé animale entre la recherche et les filières de production animale. Le Département Santé Animale (DSA) de l'INRA (Institut National de la Recherche Agronomique) fait de l'information en santé animale et santé publique vétérinaire un instrument efficace au service de sa stratégie globale. Le DSA a développé un dispositif de veille innovant s'appuyant sur une approche qualitative de l'information et une démarche en réseau. Le DSA travaille sur des thématiques de recherche au coeur des préoccupations sociétales de santé animale et de santé publique vétérinaire, favorisant le développement de liens organisés avec les filières de production animale en France. Dans le cadre du partenariat socio-professionnel, le DSA met en place une veille pour lui donner des guides stratégiques et des outils collaboratifs sur Internet, comme CERISA, le portail de la santé animale et santé publique vétérinaire, et VELISA, la veille documentaire francophone en santé animale. CERISA. Ce portail constitue le principal accès vers des ressources et des compétences en santé animale et santé publique vétérinaire en France, avec une sélection de ressources, d'acteurs géolocalisés, et une plateforme d'échanges avec les professionnels. VELISA. Ce système de veille collecte les articles concernant la santé animale publiés dans plus de 40 revues de transfert, actes de congrès, séminaires ou journées techniques spécialisés depuis l'année 2000. Ces systèmes d'information reposent sur des outils originaux utilisant les dernières technologies web et sur une nouvelle forme de gestion de l'information privilégiant sa qualité. Des données déjà

disponibles, mais consolidées, mises en perspective, liées entre elles, répertoriées par mots clés, compétences ou thématiques deviennent de puissants supports pour créer des ressources de référence dans le domaine de la santé animale, souligner l'expertise du DSA et offrir une information utile sur le terrain.

Mots clés : santé animale, santé publique vétérinaire, information, portail, veille

Introduction

Agricultural activities as a whole, including livestock production, regularly have to deal with crises and mutations. As the population grows, the livestock production and animal product processing sectors become increasingly complex. At the same time, health crises (BSE, SARS, foot and mouth disease, avian influenza, bluetongue, etc.) increase the demands of society and the livestock sectors in terms of animal health. The need for knowledge in this domain is constantly growing, and the amount of information available has considerably increased. Nevertheless, it is not always easy for professionals in the livestock production sector to access useful and reliable information.

The Animal Health Division (AHD) of INRA¹ carries out fundamental works and targeted research in areas of animal health and veterinary public health² which are of major concern to society. It has on-going and organized links with the livestock production sectors in France. In addition to producing and disseminating scientific knowledge, it must:

- Find out from professionals what their needs are, and organize its topics of research accordingly;
- Make known its fields of competence, expertise and results;
- Pass on its research results in a readily understandable form, and ensure that reliable information about animal health and veterinary public health is widely accessible.

For this reason, the AHD is gradually setting up a current awareness system with the aim of obtaining strategic support and a set of tools available on the Internet.

Current awareness can be defined as an interactive and organized relationship between an organization and its socio-economic environment (Benhamou *et al.* 1). The AHD's socio-professional current awareness project comes within this perspective. Its aims are to facilitate direct communication with professional partners in order to establish a real dialogue, based on two complementary tools: CERISA, the animal health and veterinary public health portal, and VELISA, a French-language current awareness and literature search tool for animal health.

Aims of the current awareness system

Give visibility to the animal health and veterinary public health organization

The animal health and veterinary public health organization in France is complex and difficult to discern. A wide variety of entities are involved (international organizations, central or decentralized ministerial departments, research organizations, professional organizations, etc.), their roles and skills are not always clearly defined, and the information networks can be complex, based for example on the type of disease (notifiable diseases, zoonoses, etc.).

Within this context, the aim of the project is to direct professionals towards the relevant stakeholder by providing organized and accessible information on the Internet, by:

- Rationalizing the information
- Identifying the key participants in animal health risk management or those who can provide a service or expertise
- Identifying the network of participants (links).

¹ National Institute for Agricultural Research

² Veterinary public health covers all the actions directly or indirectly related to animals, their products and by-products which have an impact on human health. It includes animal health and protection, food safety, and protection of the environment (from ENSV, <http://www2.vet-lyon.fr/ensv/SantePublVeto.htm> access 14/01/2010)

Sharing and disseminating relevant information

As part of its work, the AHD disseminates its scientific results, which are not readily accessible or useable by farmers (publication in international journals, for example). Moreover, professional information in the field of animal health comes from a wide range of sources and is frequently on paper, which makes it very heterogeneous, of variable quality, and difficult to access.

The AHD aims to provide answers to the questions frequently asked by professionals (farmers, technicians, veterinarians, etc.) by giving access to relevant resources (freely accessible information on the Internet, based either on its own work or that of other organisations) regarding livestock diseases and pathogens.

In addition to its direct partnership with livestock production sectors, the project also aims to deal with requests, foster discussion and the development of inter-professional collaboration through the Internet.

Structuring role of the reference terminology of animal diseases

The purpose of a reference terminology

A number of difficulties were identified at the start of the project:

- The large number of stakeholders involved
- Producing a comprehensive and homogeneous list by disease and animal species
- The wide range of scientific and technological fields of competence of the original portal users and their varied perspectives

Creating a reference terminology of “animal diseases” emerged as a way of organizing the collection phase, consolidating the information processing phase, and above all of simplifying access to the information for professionals. The reference terminology facilitates the use of appropriate search and navigation systems by:

- Extending searches to equivalent terms to avoid a “zero” response if the correct word is not used
- Ensuring more intuitive navigation and guided search
- cross-reference navigation within each item

However, there are a very large number of animal diseases, with very varied names (scientific, vernacular, synonyms, acronyms, etc.), and there are no terminological resources of this type in French. In English, the MESH thesaurus (in Medline) and the CAB thesaurus (in CAB Abstracts) are not sufficiently specialized; there are about one hundred cattle diseases, but only 15 are included in MESH and five in the CAB thesaurus.

Construction process

Once the theoretical reference model had been drawn up (Fig.1), an inventory of the diseases and pathogens per animal species was made with the help of academic resources (books and treatises of animal pathology, lists of notifiable animal diseases, taxonomies and nomenclatures). Relatively complete lists per animal species were drawn up following additional research on the Internet.

The selected terms were then organized and structured (list of scientific names associated with common names, synonyms and acronyms). These disease names were then linked to the corresponding pathogens, with additional notes, any associated regulatory status, and the type of disease.

Finally, this information was sent to veterinary experts for scientific validation.

The sum of all the information in the final animal disease reference terminology (82 bovine diseases, 46 rabbit diseases, 106 fish diseases, etc.) makes it a unique knowledge base, and at the same time a professional tool which will significantly help organize the Internet tools of the socio-professional current-awareness project.

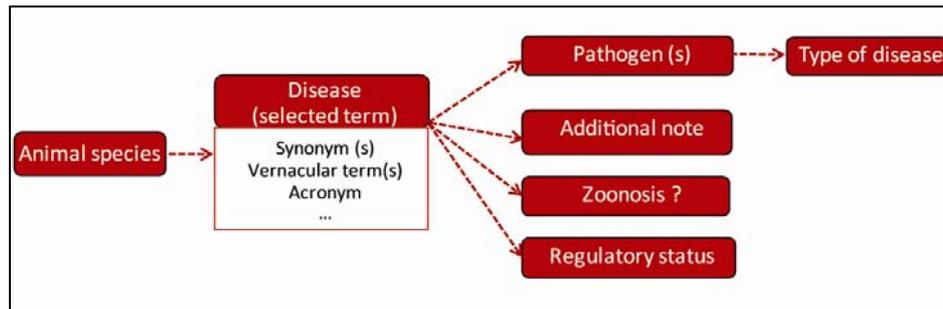


Figure 1 – Theoretical reference model

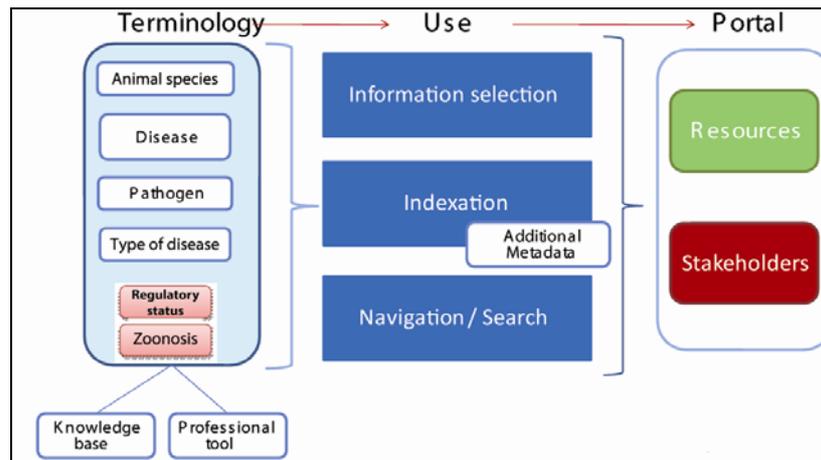


Figure 2 – Use of the reference terminology

Information management: giving priority to quality

Collecting and selecting information

Due to the very large number of diseases, this collection phase is delicate with a high risk of the information being scattered and incomplete. The reference terminology will make it possible to prioritize the diseases, and consequently the information search, according to certain criteria (type of disease, risk of contagion, extent of economic loss, etc.). It will also help enter queries into the search engines, through the use of all the forms of the disease name, together with the pathogen if necessary.

The reference terminology organizes the collection phase and makes it more coherent and efficient. Searches are made directly on public sites (ministry of agriculture, research bodies, teaching establishments, etc.), professional sites (technical institutes, professional associations, etc.), or with the help of specialist and generalist search engines.

From these searches it will be possible to identify a large amount of information, but the results may be very mixed. To reduce this heterogeneity, criteria will be needed to objectivize the selection. The main selection criteria for the stakeholders involved is their role in animal health or veterinary public health, their specialization and skills. This work requires a good understanding of the matrix organization of animal health and veterinary public health, and of the impact of regulations on information flow and the role of all the stakeholders involved. The work is based on the knowledge of the project's veterinary expert.

The selection criteria for the resources are somewhat different: availability of the full text, information accessible to a non-scientific but well-informed public (livestock professionals, veterinarians, etc.), quality of the information (identified authors, credibility of the site, date of the information, etc.). The nature of selected resources is varied: fact sheets, articles in professional journals, extracts from veterinarian theses, etc.). The selection work requires a good understanding of the field of animal health

and a broad vision of the information to ensure that all the aspects of a particular problem are correctly covered through the proposed resources (knowledge of a disease, potential regulations, diagnosis and treatment, prevention, herd management, etc.).

This collection and selection phase is particularly delicate. It requires a large amount of careful work by the project team, determining the quality of the information which will be made accessible to professionals.

Processing and analysis

In this stage, the selected information (stakeholders and resources) is enhanced to meet the objectives set by the current awareness project, creating original contents. This work is essential to produce knowledge which is useful for professionals and is based on the internal expertise of the AHD (veterinary and IT expertise). The process is as follows:

- Bringing together the information which has been collected
- Adding metadata and appraisal with the help of the reference terminology
- creating links between the items of information.

Processing information about the stakeholders involved

Analyzing information about the different stakeholders involved will provide a better knowledge of the system by identifying relationships within the animal health and veterinary public health organization. A flow-chart shows the links and flow of information between the stakeholders involved, and includes their roles, skills and specialities (possible use of the reference terminology). The aim of establishing these links is to make it easier to understand the nature of the interactions. The data is completed with contact details and geolocation.

Processing information about the resources

Information about the resources includes a set of metadata (description, key-words, animal species, diseases, etc.), providing a thorough search system as well as improved identification of the content of the information selected. It is essential here to use the reference terminology and approved lists. This facilitates the addition of metadata, with a direct impact on the quality of indexation and homogeneous management of the information. The resources are also linked to the stakeholders and other resources involved. These links provide information that is as complete as possible and cross-reference navigation within a portal-type tool.

By processing information in this way, it is possible to create new knowledge that has been validated and selected for its quality and use in the field. This outcome highlights the AHD's expertise in this domain.

A current awareness system for up-to-date information

The efficiency of a portal-type Internet tool such as the one in the socio-professional awareness project is based on constant up-dating and on the most comprehensive and relevant information. A current awareness system must allow the project team to follow developments and provide the tool with up-dated information (regularly reading professional journals, monitoring regulations and current events in the domain, systematic alerts on certain sites, etc.).

Disseminating and sharing information: CERISA and VELISA

Creating knowledge becomes meaningful and useful when it is shared, accessible and usable. With this in mind, and as part of its socio-professional current-awareness project, AHD created CERISA and VELISA as easy-access tools for direct use by professionals. These tools are based on Web 2.0 technologies, and therefore provide possibilities of geolocation, syndication feed to make information available in real time or to syndicate the content of other sites, and more ergonomic interfaces.

CERISA – The animal health and veterinary public health portal

This information portal is the main outcome of AHD's socio-professional current-awareness process on Internet. On the one hand it makes it possible to identify and access all the stakeholders working in animal health and veterinary public health in France (and shortly all French-speaking countries). On the other hand, it facilitates access to information in French on livestock diseases and pathogens per animal

species. The design has been broadened to give professionals access to a “partner space” where they can exchange information.

In January 2010, CERISA contained 724 selected resources, 566 recognized stakeholders involved, 676 pathogens and 412 listed diseases. The home page (Fig.3) enables users to:

- Access menus and sub-menus
- Carry out a guided search by animal species, by stakeholder (from A to Z), by disease and pathogen (from A to Z), with direct access to “notifiable diseases”
- Use a geolocation system
- Access an internal search engine.

There are additional functionalities which can be accessed from the home page (RSS feed, secure access to the “partner space”, to summary information, and to current news via the “Animal Health news” and “Seen in the specialized press” headings (syndication from VELISA).

Figure 3 – CERISA Portal Home page - <http://www.sante-animale.eu>

VELISA - French-language current awareness and literature search for animal health

This current awareness tool of the AHD, complementing the CERISA information portal, has three purposes:

- To reference professional information about animal health found in professional veterinary or livestock research journals (essentially on paper, and rarely referenced in national or international data bases)
- Based on this work, to identify any emerging health problems on farms
- To make known the regular contributions of AHD scientists to the professional literature.

In this way, 40 journals, the contents of scientific and technical seminars are systematically examined on publication, with items dating back to 2000. Altogether, about 4500 references were accessible on

VELISA in January 2010, with key words, pathogens, animal species etc. To our knowledge, this is the only current awareness system of this type in French.

The VELISA home page (Fig 4) gives users access to the references by:

- The last 20 references entered
- Articles written by AHD scientists
- The internal search engine
- Diseases, pathogens, animal species or key-words
- Journals and conference proceedings (and by year of publication).

As in CERISA, other functionalities are accessible on the home page.

Veille documentaire et littérature francophone pour les acteurs et professionnels de la Santé Animale et de la Santé Publique Vétérinaire

VelISA - Santé Animale

La veille documentaire et la littérature francophone pour les acteurs et professionnels de la Santé Animale et de la Santé Publique Vétérinaire.

Cet outil de veille du département Santé animale de l'Inra permet de rassembler dans une base de données accessible en internet, les références des articles parus dans la presse professionnelle et spécialisée ainsi que les colloques scientifiques et techniques spécialisés concernant la santé animale et la santé publique vétérinaire. Il s'agit soit d'articles de synthèse, soit d'articles de vulgarisation, soit d'articles techniquement assez pointus.

Pourquoi un site spécialisé en références documentaires à destination des acteurs francophones et professionnels de la Santé Animale et de la Santé Publique Vétérinaire ?

Ces informations sont complémentaires des publications scientifiques qui constituent le vecteur de diffusion classique des chercheurs du Département de Santé Animale de l'INRA. Ces dernières sont parfois d'accès difficiles pour des lecteurs non avertis. Elles peuvent être obtenues directement sur le site du département Santé Animale <http://www.inra.fr/sa/>. En revanche, le texte intégral des articles scientifiques ne peut être obtenu que sur consultation de sites scientifiques spécialisés.

Il est donc important de pouvoir donner accès au plus grand nombre des partenaires du département Santé Animale à des informations actualisées et centralisées. En effet, toutes les revues professionnelles ne mettent pas en ligne les sommaires de leurs revues ou les références de leurs articles. De plus les références des colloques et symposia sont souvent très labiles.

Les chercheurs du département Santé Animale sont des contributeurs très fréquents pour les articles de transfert dans les revues spécialisées. De nombreuses demandes effectuées auprès du Département peuvent facilement être résolues à partir des excellents produits de documentation fournis par des éditeurs professionnels.

Cette base de données permet de trouver de façon intuitive les références d'articles pertinents sur un sujet donné. Pour plus d'informations, consulter notre rubrique [En savoir plus](#).

Organisation et services offerts	Contenu actuel de la base de données
<p>Plus de 40 revues, les contenus de colloques (3SR, JRA, JRP, etc.) sont dépouillés pour alimenter la base de données.</p> <p>Les références sont systématiquement associées à des mots clés, agents pathogènes, maladies, espèces animales.</p> <p>La mise à jour de cette base se fait en continu. Ce sont les références qui sont mises en lignes et pas les articles qui doivent être demandés aux éditeurs. Une base de contacts (adresse, site web des revues et/ou éditeurs) est fournie en ligne pour compléter les informations.</p>	<p>Dernière mise à jour : 07/01/2010 16:30:02</p> <p>4536 références 4136 mots clés 3011 auteurs 1005 agents pathogènes 749 maladies 18 espèces 63 revues et colloques</p>

Dernières informations

07/01/2010 La prévention est à privilégier pour limiter leur impact.
Réussir Bovins Viande 2008; 145:44-46

07/01/2010 La dynamique d'infestation des strongles conditionne la lutte.
Réussir Bovins Viande 2008; 147:70-72

07/01/2010 Repérer les différents troubles cérébraux des bovins.
Réussir Bovins Viande 2008; 149:64-65

07/01/2010 "Tirons les leçons des crises sanitaires des dernières années".
Réussir Bovins Viande 2008; 152:11 p

07/01/2010 Le virus de la fièvre catarrhale ovine contaminé aussi le fœtus in utero.
Réussir Bovins Viande 2008; 152:122

07/01/2010 Les culicoides réveillent peu à peu leurs secrets.
Réussir Bovins Viande 2009; 156:48-49

Plus d'informations

Figure 4 –VELISA Home page – <http://www.toulouse.inra.fr/velisa>

Conclusion

The socio-professional current awareness project of the Animal Health Department of INRA is based on a close collaboration between scientists and IT professionals. Collaboration with other scientific or technical organizations in France and French-speaking countries, which often have complementary tools, could add to the quality, maintenance and development of the system, to the mutual advantage of the organizations and the livestock production sectors.

With regard to the management of the information, the future development of the reference terminology on the semantic web will facilitate the maintenance of the reference terminology, the interoperability of the data and their accessibility for the animal health and veterinary public health community.

References

- BENHAMOU P., ERMINE J.L., ROSENTHAL-SABROUX C., ROUSSEAU F., TOUNKARA T., 2000. De la recherche d'information à la création de connaissance : une approche opérationnelle basée sur l'interaction entre veille et gestion des connaissances, *INFORSID 2000, Lyon, 16-19 mai 2000*, 331-346. <http://134.214.81.35/articles/a322c1o9jWcKe2lpU.pdf>
- DELAHOUSSE J., 2009. Gestion d'une terminologie d'entreprise : utilisations, enjeux et différentes formes d'organisation. *KnowledgeMag*, (2). <http://www.knowledgeconsult.com/fr/knowledgemag/numero2-3.html>