

Systeme de veille sanitaire pour analyser l'émergence et la propagation de maladies animales

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La veille en santé animale, et notamment la détection précoce d'émergences au niveau mondial d'agents pathogènes, est l'un des moyens permettant de prévenir l'introduction en France de dangers sanitaires (Paquet et al., 2006)



Depuis 2013, développement d'un système de veille automatisé, **basé sur des dépêches d'actualité provenant du Web**, complémentaire aux sources officielles

PAQUET C., COULOMBIER D., KAISER R. & CIOTTI M. (2006). Epidemic intelligence : a new framework for strengthening disease surveillance in Europe. *Euro surveillance*, 11(12), 212–214.

Sources officielles et médias



	Officielles	Non officielles
+	<ul style="list-style-type: none">• Information vérifiée• Information structurée : données pertinentes faciles à extraire	<ul style="list-style-type: none">• Information immédiate
-	<ul style="list-style-type: none">• Information non immédiate : parfois retard important (> 1 mois) entre notifications d'émergence d'une maladie et date de première observation	<ul style="list-style-type: none">• Information non vérifiée• Information non structurée : données pertinentes difficiles à extraire



Complémentaires

Systèmes automatiques de veille médias

- Systèmes développés depuis 2006, mais **essentiellement en santé humaine** (OMS, ECDC (Europe), Institute for Public Health (Canada), CDC (USA))
- En 2009, à l'INRA (dép. Santé Animale), Jacques Barnouin et Jocelyn De Goër ont créé New@Diseases (n'est plus utilisé depuis 2011)



➔ Nouveau système s'inspire de New@Diseases

- 1) **recueillir quotidiennement des dépêches** épidémiologiques provenant de sources non-officielles, incluant les médias électroniques.
- 2) **extraire automatiquement les informations** (nom de maladie ou symptômes, lieu, date et espèce touchée).
- 3) **effectuer une restitution synthétique** et agrégée de l'information : cartes, séries spatio-temporelles...

Eastern Europe continues ASF struggle

By Vladislav Vorotnikov , 25-May-2016
Last updated on 25-May-2016 at 12:51 GMT

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The FAO warns African swine fever could become a pan-European problem

Related tags: African swine fever, ASF, Europe, Eastern Europe, Pork, United Nations, UN, Food and Agriculture Organization, FAO, Poland, Estonia, Latvia, Ukraine, Russia

African swine fever (ASF) continues to spread into new territories in Latvia, Estonia, Ukraine and Russia, threatening the stability of the pig industry in these countries, according to reports from local veterinarians.

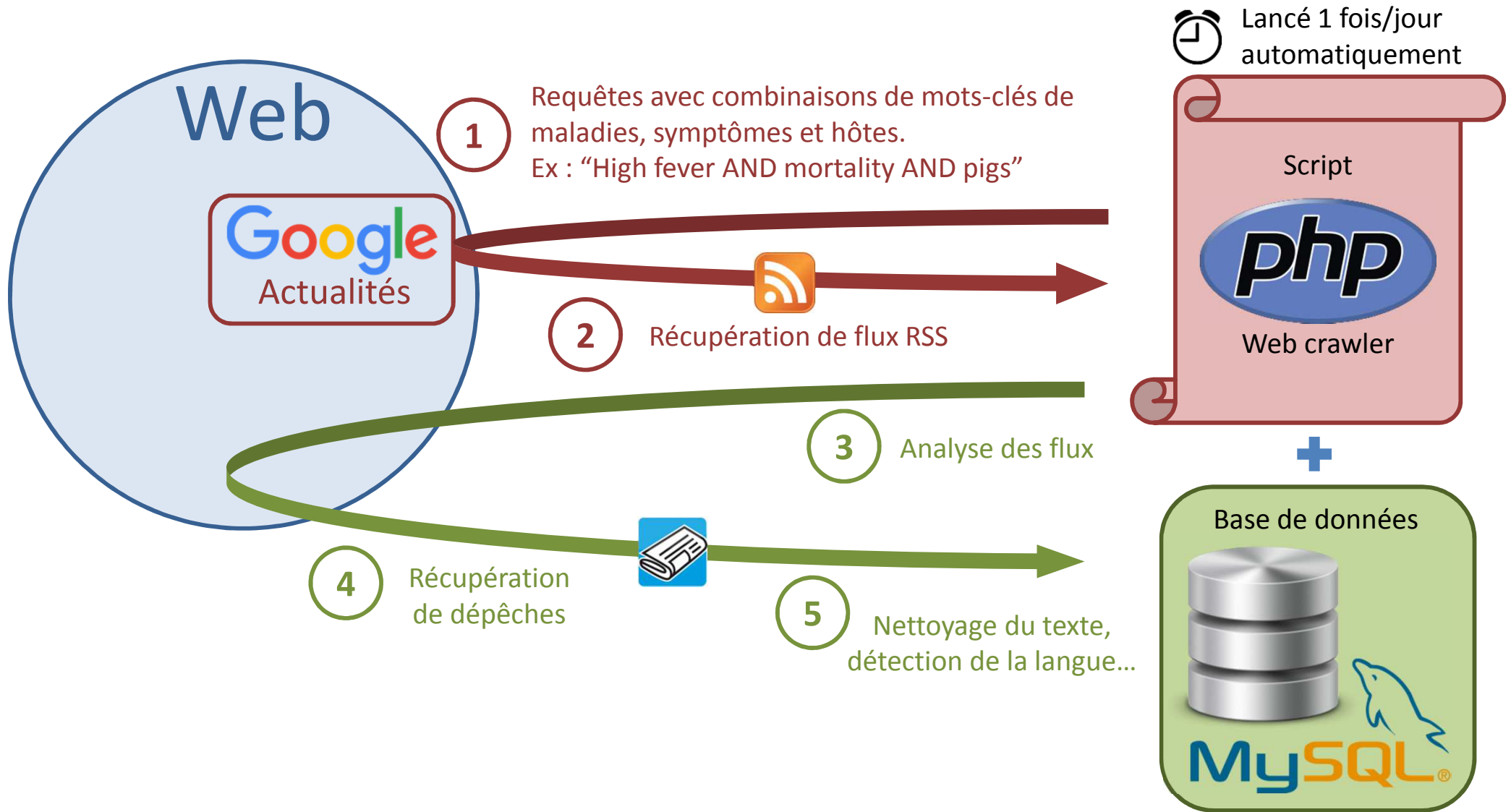
A spokesperson for the Latvian Food and Veterinary Service (FVS) Ilse Meister revealed that, since the beginning of the year, the number of infected boars in the country tripled versus the same period last year, reaching a total of 411 head. The situation may get worse in the months ahead, as the disease spreads during warm weather.

"FVS notes that spring and summer is the period of increased danger for ASF disease [outbreaks], so it is necessary to comply with comprehensive biosecurity measures to prevent the disease penetrating the domestic pig population," said Meister.

In neighbouring Estonia, local veterinary experts are concerned over NATO military manoeuvres for Kevadtorm [the Estonian Defence Army's spring drill] involving hundreds of soldiers trespassing into ASF quarantine zones, with the danger of them transferring the disease to new areas in Estonia or nearby countries.

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Processus de recueil



Quels sont les mot-clés adaptés à l'acquisition de documents pertinents ?

Processus de recueil : définition des mots-clés

1ère étape : par fouille de texte

Ex : peste porcine africaine



Documents
pertinents

Extraction de la terminologie

The screenshot shows the BioTex web application interface. At the top, there is a navigation bar with 'Extraction' selected. Below the navigation bar, there is a yellow alert box stating: 'Alert: This application does not work with Firefox, it only works with Google Chrome, Safari and Internet Explorer'. The main content area is divided into several sections: 'Patterns Information' with a text input for 'Number of linguistic patterns' set to '200'; 'Type of terms to extract' with radio buttons for 'All Terms' and 'Multi Terms' (selected); 'Measures selection and data' with a dropdown for 'Select ranking measure' set to 'F-TFIDF-C' and 'MAX', and radio buttons for 'Single Document' and 'Set of Documents' (selected). There is also a 'File source' section with a 'Parcourir...' button and a 'Language of your text' dropdown set to 'English'. An 'Extract Terms' button is located at the bottom right. On the right side of the interface, there are logos for 'Institutions' (Laboratoire Informatique Robotique Microélectronique Montpellier, Université Montpellier) and 'Sponsors' (CNRS, TETIS, SIFR project).

Liste de termes

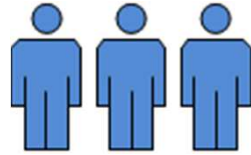
1. African swine fever
2. DNA arbovirus in pigs
3. Wild boar population

Principe:

- Filtre linguistique
- Pondération statistique

LOSSIO-VENTURA J. A., JONQUET C., ROCHE M. & TEISSEIRE M. (2016). Biomedical term extraction: overview and a new methodology. *Inf. Retr. Journal*, 19(1-2), 59–99.

2ème étape : avis des experts



Sélection de termes pertinents issus de la fouille de texte

1. African swine fever
2. DNA arbovirus in pigs
3. Wild boar population
4. ~~Kitchen waste~~



Construction de requêtes



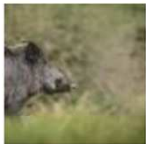
[https://news.google.com/news/feeds?pz=1&cf=all&ned=en&q="African+swine+fever"+OR+"DNA+arbovirus+in+pigs"&output=rss](https://news.google.com/news/feeds?pz=1&cf=all&ned=en&q=)



Google News

[Eastern Europe continues ASF struggle - GlobalMeatNews.com](#)

mercredi 25 mai 2016 12:56



[Eastern Europe continues ASF struggle](#)

GlobalMeatNews.com

African swine fever (ASF) continues to spread into new territories in Latvia, Estonia, Ukraine and Russia, threatening the stability of the pig industry in these countries, according to reports from local veterinarians.

[GlobalMeatNews.com](#)

[Latvia: African swine fever may become endemic problem for entire Eastern Europe - The Baltic Course](#)

jeudi 7 avril 2016 08:42

[Latvia: African swine fever may become endemic problem for entire Eastern Europe](#)

The Baltic Course

African swine fever may become an endemic problem for Eastern Europe if no effective solutions are found, the Food and Veterinary Service's Director General in Latvia Maris Balodis told Saeima Parliamentary Inquiry Committee on April 6th, cites LETA.

Récupération d'informations sur les dépêches

- Date de publication
- Titre de la dépêche
- Description / résumé
- Lien hypertexte sur l'article

Processus de recueil : récupération et nettoyage



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Thursday, 02.06.2016, 16:21

Latvia: African swine fever may become endemic problem for entire Eastern Europe

BC, Riga, 07.04.2016.

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African swine fever may become an endemic problem for Eastern Europe if no effective solutions are found, the Food and Veterinary Service's Director General in Latvia Maris Balodis told Saeima Parliamentary Inquiry Committee on April 6th, cites LETA.



"If no solutions are found and implemented, we may expect it to become a lasting problem, possibly an endemic situation in not just Latvia, but in the entire Eastern Europe," stressed Balodis.

Latvia's wild boar population is still affected by African swine fever, and the problem is not likely to go away, said Balodis. The disease is spreading into new territories as animals infect each other.

There is a program, co-financed by the European Union, that is aimed at reducing the population of wild boars in Latvia and therefore limit the spread of African swine fever. Hunters have hunted over 10,000 wild boar sows by November 20 last year, said Balodis. The program will also continue this year. Latvia has allocated EUR 1.6 million for the program in 2016, added Balodis.

The Food and Veterinary Service checks farms in areas affected by African swine fever at least twice a year, and all other farms that keep pigs – at least once a year. Last year, African swine fever was ascertained at ten small farms.

According to the State Forest Service's data, there are more than 70,000 wild boars living in Latvia.

In total, 1,048 wild boars infected with African swine fever were found last year. Since the first African swine fever case was registered in Latvia in June 2014, a total of 213 domestic pigs were found to have the disease in Rezekne, Mazsalaca, Ainazi, Staicele, Ambeli and Vecsaliena regions. A total of 14,000 pigs had to be destroyed for biosafety reasons, and the owners of these pigs were paid EUR 2.322 million in compensation.

EDITOR'S NOTE

Nordic's economic model for Baltic States to emulate

Thinking and doing "Nordic" becomes both fashionable and perspective in modern world. The US government decided to invite Nordic leaders to the White House to get first-hand information on the region's progressive development. Is there anything that the Baltic States can emulate too?

LEGAL COUNSEL

11.04.2016. **Conclusion of same-sex marriage in Europe**

11.04.2016. **On the protection of personal data in Latvia**

World First can help you save money. Find out how. WorldFirst

Latvia: African swine fever may become endemic problem for entire Eastern Europe :: The Baltic Course | Baltic States news & analytics



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• **Nettoyage de la page Web** de la dépêche afin de ne garder que le texte utile
Utilisation de la librairie PHP ReadAbility

• Premier filtrage : **détection de mots-clés « importants »** : outbreak, case, contamination...

• **Détection de la langue** : Text_LanguageDetect issue de la librairie PHP PEAR

Interface web de consultation des articles collectés

Consultation

- Consultation des dernières dépêches aspirées ou publiées
- Formulaire de recherche avancée
- Consultation de statistiques descriptives

Paramétrage

- Gestion des flux RSS

Recherche par titre :

Recherche contenu :

Résultat Recherche

latvia: african swine fever may become endemic problem for entire eastern europe - the baltic course
Latvia: African swine fever may become endemic problem for entire Eastern Europe :: The Baltic Course
African swine fever may become an endemic p...

kenya : african swine fever
African swine fever:Kenya
Information received on 02/05/2016 from Dr Kisa J. Z. Juma Ngeiywa, CVO Director of Veterinary Services, State De...

brazil ready to help russia cope with african swine fever - sputnik international
Brazil Ready to Help Russia Cope With African Swine Fever
Business11 20 12 10 2015/undated 11 31 12 10 2015) Get shared IIP1 (MOSCOW /Sputnik) Da

Titre : Latvia: African swine fever may become endemic problem for entire Eastern Europe - The Baltic Course
Date parution : 07-04-2016 08:42
Mots-clés : African swine fever - fever - pig
Source : The Baltic Course

Latvia: African swine fever may become endemic problem for entire Eastern Europe :: The Baltic Course
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Critères

Non-officiel

Maladie

Avian influenza
Bluetongue
Foot-and-mouth disease
Schmallenberg virus infection
Peste porcine africaine
Influenza aviaire

African swine fever

Symptôme

Congénital
Digestive
General
Hémorragique
Mortalité
Mucocutané

Fever

Hôte

Avian
Bovine
Autre ruminant
Ovine/caprine
Oiseaux

Porcine

Source

The Guardian
ood.com (subscription)
Western Telegraph
Agriland
thuania : African swine fever
NBCNews.com

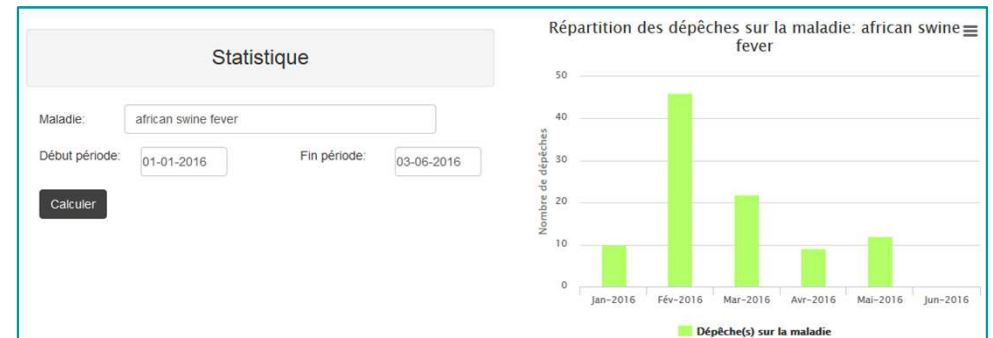
The Baltic Course

Date début période: 01-01-2016 Date fin période: 03-06-2016

Rechercher

Recherche par titre :

Recherche contenu :



Objectif


Automatiquement détecter les **informations clés** depuis les dépêches tirées du Web (lieu, espèces, maladies, nombres de cas, dates, ...)

“Since its initial appearance in **Poland** in **February 2014**, **72** cases of **African Swine Fever** have been detected in **wild boars** and there have been three outbreaks in **pigs**.”

- <http://www.thenews.pl>

Approche simple basée sur des dictionnaires

- Usage de **dictionnaires** (Geonames, HeidelTime, listes de noms de maladies, d'espèces, etc.)
- Besoin de **règles** afin de détecter lorsqu'un candidat correspond à l'information recherchée
- Définir un ensemble de règles manuellement est **difficile** et **long**

 Nous proposons de découvrir automatiquement les règles utiles en exploitant des techniques de fouille de données (extraction de règles d'association)

Extraction d'informations

Classification SVM (les règles sont les descripteurs)

- **(number)(speciesName,1-3)** fréquence **26%**, confiance **83%**
« *Lorsqu'un nombre est suivi d'un nom d'espèce dans un des 3 mots suivants, alors c'est un nombre de cas avec une confiance de 83%* »

Résultats obtenus sur un corpus annoté (350+ articles en anglais)

- **3 classes** : correct, incorrect, partial
- Validation croisée (10 ensembles)

Type d'information	Accuracy
Lieux	70.64%
Dates	71.2%
Maladies	93.58%
Nombres de cas	78.1%
Espèce	89.47%

Extraction d'informations : interface web

Titre : Latvia: African swine fever may become endemic problem for entire Eastern Europe - The Baltic Course

Date parution : 07-04-2016 08:42

Mots-clés : African swine fever - fever - pig

Source : [The Baltic Course](#)

LOCATION



🌐 Lieu

📅 Date

⚠️ Maladie

🐷 Espèce

Nombre de cas

Latvia: African swine fever may become endemic problem for entire Eastern Europe - The Baltic Course

📍 **Latvia** : 🚩 African 🐷 swine fever may become endemic problem for entire Eastern Europe - The Baltic Course

Latvia : 🚩 African 🐷 swine fever may become endemic problem for entire Eastern Europe : : The Baltic Course

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Etudes de cas et perspectives

- Maladies actuellement surveillées :

- Peste porcine africaine

- Influenza aviaire

- Fièvre catarrhale ovine

- Fièvre aphteuse

- Maladie de Schmallenberg

- Le système multilingue sera utilisé par la Plateforme ESA pour la France et par le réseau de vétérinaires CaribVet situé dans les Caraïbes

- Les informations extraites à partir des dépêches seront **comparées** aux informations issues des données officielles **afin de mettre en relief la découverte de l'émergence de maladies animales.**

Remerciements

- Les organismes financeurs :
Direction Générale de l'Alimentation
Labex Numev (ANR-10-LABX-20)
- Les étudiants ayant participé au développement de l'outil :
Max Devaud, Thomas Filiol, Baptiste Belot et Clément Hemeury
- CATI Informations et Données en Epidémiologie Animale (dép. SA, INRA)

Démo mercredi à partir de 16h30

Contact : sylvain.falala@cirad.fr

