

Linking-Up Animal Health Related Information to an Integrated Animal-Health System

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Abstract

EU-regulation (EG) 178/2002 has laid out general principles and requirements for the food law. Some of these principles and requirements are related to the issues of traceability and quality assurance along agro food chains and affect all participants of the supply-value chain. This paper focuses on the implementation of these requirements within the farmer and veterinarian segments of the supply-value chain. Farmers and veterinarians are responsible for animal health, which is one of the key aspects of quality assurance. Furthermore, both groups already document information related to animal health. Often, the documentation is comprehensive and at times redundant, and is accomplished manually. Currently in Germany, an IT-solution does not exist for the entire supply-value chain of livestock farming and animal products; only isolated IT-solutions exist. An integrated IT-solution for farmers and veterinarians has not yet been developed in Germany. In this paper, the first results of an analysis of stakeholder acceptance of IT-solutions will be presented (livestock farmers and veterinarians). This project is part of the BMBF-funded joint project IT Food Trace, in collaboration with IBM.

Key words: *IT-based animal health system, traceability, quality assurance, veterinarians, farmers*

1 Introduction

Changes in EU-regulations regarding traceability and quality assurance require IT-based data documentation of relevant information along the agro food chain (e.g. regulation (EC) Nr. 178/2002) (Unknown author, 2006). These regulations affect many participants in the supply value chain including farmers and veterinarians. Both groups must comply with the regulation (EC) 178/2002, which is also connected to national regulations (e.g. German regulation concerning veterinary medicine chest (TÄHAV)). Livestock farmers and veterinarians partially document the same information and depend on information from each other (e.g. veterinary medicine chest) (Gollé-Leidreiter, 2004). The veterinarians pass the application- and dispensing document (Anwendungs- und Abgabebeleg) to the livestock farmer. This form includes the following information: animal identity, diagnosis, medicine, charge identification, quantity of application, dosage, waiting period (standby time). The livestock farmer must keep a “stock book”, which contains information regarding animal identity, medicine, dosage, date of application, waiting period in days and the name of the person that administers the medication (Rothfuß, 2006).

The documentations of both farmers and veterinarians are also important information sources for public administration. More transparency of quality assurance and traceability could be obtained, but would involve higher administrative expenses for all process participants involved, as well as a redundancy of certain data (e.g. identity of animals) and a lack of efficiency (Rothfuß, 2006).

According to EU- and national regulations (e.g. regulation (EC) Nr. 178/2002, German regulation concerning veterinary medicine chest (TÄHAV), German regulation on the obligation to produce supporting documents for livestock farmer), IT-solutions are allowed, however currently only isolated applications exist along the supply-value chain “livestock farming”. An integrated IT-solution for livestock farmers and veterinarians has not yet been developed and standardised interfaces are not common between the presently employed technologies. An IT-based integrated animal-health system would not only guarantee a higher level of traceability and quality assurance for customers and public authorities, but should also help livestock farmers and veterinarians to optimise production management.

For example, animal-specific analysis and increased animal health prophylaxis could lead to a reduction in costs.

2 Objectives

This sub-project of IT FoodTrace (www.itfoodtrace.de) focuses on the analysis of data acquisition, data flows and data retrieval between selected process participants (e.g. livestock farmers, veterinarians, public authorities). Available data (systems) from each of the process participants, which are often decentralized, deficient and redundant, will be consolidated into an integrated-animal-health system for cattle and pigs. This will allow an optimised utilisation of already evaluated data on animal health. Connected to the conception of IT-models are concepts of user rights and responsibilities for data and information. All relevant professional organisations are involved in this project as associated partners and support this project (e.g. on the livestock farmers' side: Federal Association on Yield recording in Animal Production, and on the veterinarians' side: Federal Veterinarians Chamber, Association of Practicing Veterinarians). This project is not driven by the government so that it will run through the inputs and the interest of the associated partners. Governmental institutions are involved in this project on specific issues. The project will run until summer 2009.

3 Conception and methods

The conception and development of the IT-model can be divided into five steps:

- i. Sensitisation and analysis of acceptance of stakeholders (livestock farmers, veterinarians, public authorities)
- ii. Comparative analysis of different IT-applications for animal health
- iii. Conception and verification of various IT-applications
- iv. Exemplary implementation of an IT-model, concept development regarding user rights and responsibilities
- v. Evaluation and improvement of the chosen IT-model

A combination of methods will be involved in the execution of these steps. Table 1 connects the steps with their related method.

Table 1: Combination of methods

Steps	Methods
Sensitisation and analysis of acceptance	Survey - written survey; - guideline-based interviews with experts - participatory monitoring Documents analysis
Comparative analysis of different IT-applications to animal health	Case analysis
Conception and verification of various IT-applications	Lead-User-Analysis Data-Flow Modelling
Exemplary implementation of an IT-model	Specification sheet
Evaluation and improvement of the chosen IT-model	Benchmark-Analysis

4 Acceptance Analysis

The acceptance analysis consists of two surveys, the participatory monitoring of two information sessions for veterinarians and livestock farmers, guideline-based interviews with experts and a document analysis. The following results are from the questionnaires. After a short briefing about the research design, the results will be presented.

4.1 Research design

Within the scope of step one, livestock farmers and veterinarians in the German federal state of Baden-Württemberg were surveyed with the aid of a standardised, written questionnaire: the veterinarian-survey

was self-administered survey, the livestock farmer-survey was assisted. Both surveys contained primarily closed questions.

The survey was conducted between December 2006 and January 2007. Eighty dairy farmers and 400 veterinarians (equivalent to 75% of practising veterinarians, with an emphasis on large and mixed-animal practices) were asked to participate in the survey. Sampling criterion for dairy farmers was that the dairy farm had to have more than 40 dairy cows. This is the minimum farm size, which makes the investment in and the practical application of information- and communication technology efficient. For veterinarians, the sampling criterion was a primary focus on large and mixed animal practices.

The number of questionnaires returned by veterinarians was 79, which translated into a return rate of 20 percent. In the case of livestock farmers a return rate of 100 percent was achieved because of the support by the LKV-staff. Both samples were not representative.

Research questions included:

1. What is the state of the IT-technical equipment of livestock farmers and veterinarians?
2. How are the relevant working procedures carried out and how much time is required for relevant operational procedures?
3. What benefits of an animal-health system can be identified by the potential user?

4.2 Selected results

The first research question provides information regarding the **IT-technical equipment** in hard- and software. Furthermore, it identifies the most popular veterinary software. Fig. 1 shows a potential version of an animal-health data network. To achieve a high level of acceptance amongst potential users, veterinarians and livestock farmer must be free in their choice of how information will be transferred to the integrated animal-health system.

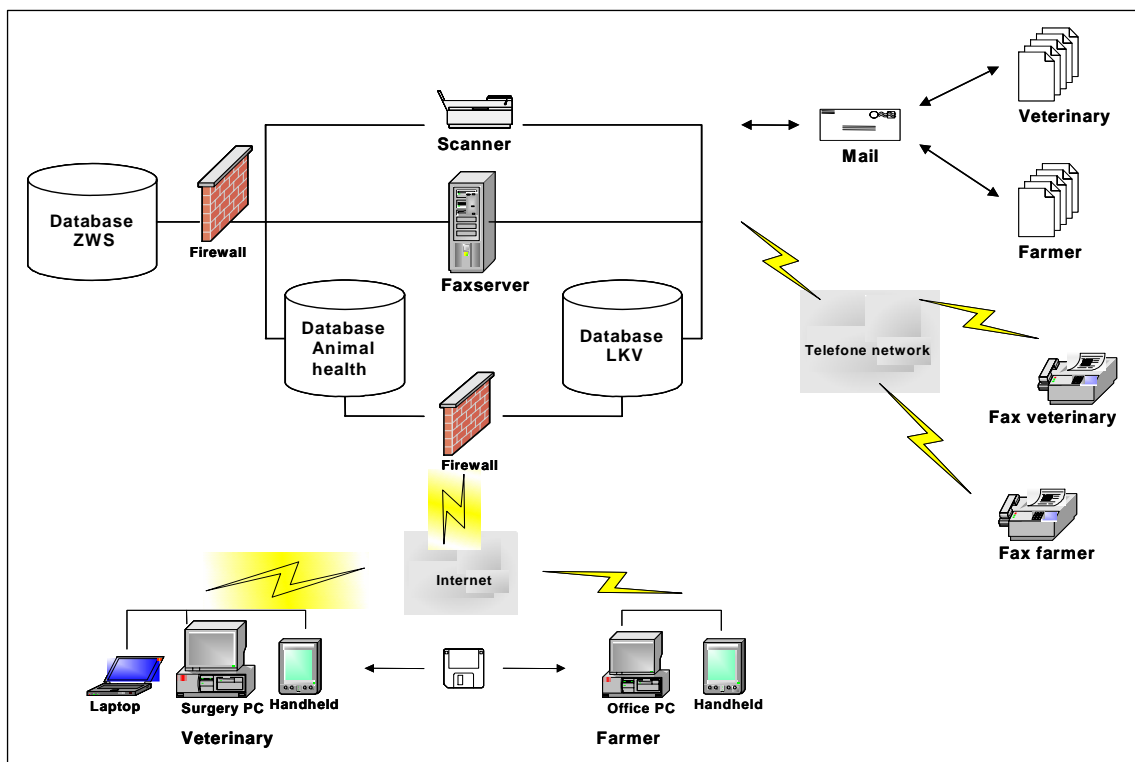


Fig. 1: Animal health –data network (Source: Doluschitz, 2004a)

However, the main focus of this new IT-based system will be on new information and communication technology (ICT). Results of the questionnaire analysis showed that the technical equipment of veterinarians mostly consists of the desktop-office PC (96%), followed by the notebook (39%). mobile-output devices (20%) or mobile-input units like PDAs (3%) are quite rare. The technical equipment of livestock farmers had been documented indirectly through working procedures. The use of the desktop-

office PC is high. This goes along with national and international studies of Doluschitz and Pape (2001), Rosskopf and Wagner (2003) and NASS (2005). The use of sectoral software is widespread (veterinarians 82%, livestock farmers 63%). Livestock farmers predominantly utilise acreage index and cow planer. Veterinarians use practice management software. Circa 60 percent of the veterinarians questioned use three software programmes.

The internet is one of the main ICT. The access to and the use of the internet are key factors in the successful implementation of an integrated animal-health system. Fig. 2 shows internet access and the focus on internet-use by veterinarians and livestock farmers.

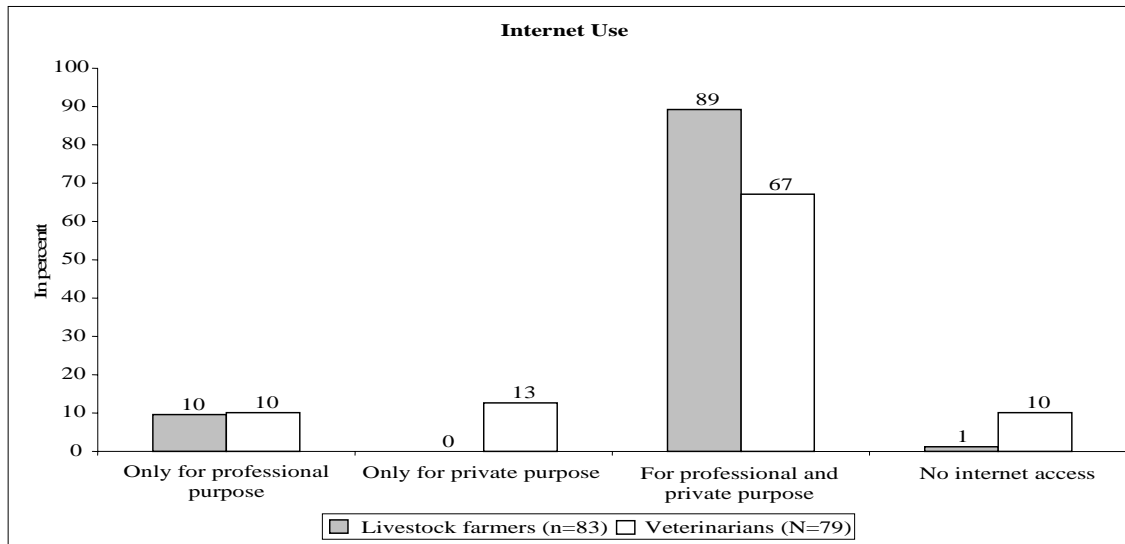


Fig. 2: Internet Use

Nearly 100 percent of the livestock farmers questioned have internet access and use the internet for professional purposes. Only 10 percent of the veterinarians do not connect to the internet. About three quarters use the internet for professional purposes.

The research question - how are the relevant **working procedures** carried out and how much time is required for relevant operational procedures - should provide information about specific operational procedures which can be accomplished digitally, for example completing the application- and dispensing document or administrating the stock book. Mostly, the livestock farmers administrate the stock book manually. The application- and dispensing document is passed personally from the veterinarian to the farmer. This was caused by the legal regulation effective until end of the year 2006. Now, it is possible to transfer this document via email or digital form. An indicator for the popularity of internet use by livestock farmers is the notification of animal data to the HI-T database (national animal identification data-base). The majority of interviewees (85%) are notifying the HI-T database via internet. 20% of farmers use fax/mail. Information transfer by phone is infrequent (1%).

Research question number three - what **benefits** can be identified by the potential user - shall verify a theoretical analysis on the expenses and benefits of the animal-health database. Fig. 3 shows the theoretical analysis on the benefits and expenses for veterinarian and livestock farmer.

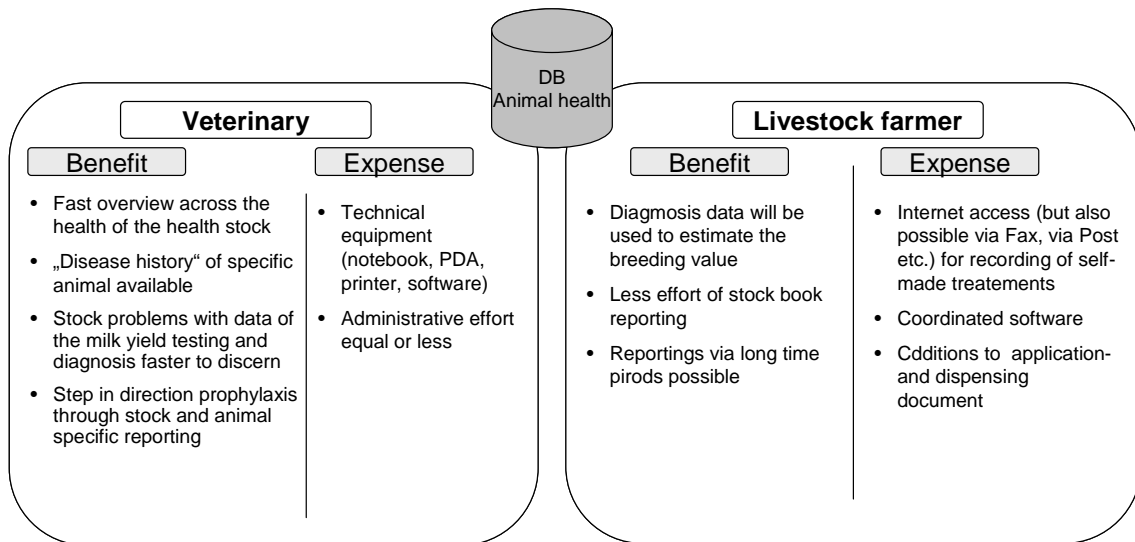


Fig. 3: Benefit-Expenses-Comparison for Veterinary and Livestock farmer (Source: Doluschitz according Gollé-Leidreiter, 2004b modified)

Livestock farmers emphasize their interest in an integrated animal-health system and the linkage between animal-health data and data from milk-yield recording (76%). Around half of the livestock farmers interviewed (51%) would take part in an IT-based animal-health system; a further 27 percent are undecided. The analysis showed that livestock farmers and veterinarians identify the same expedient applications, which can generate a benefit for them (see table 2). These results go in line with the theoretical analysis of benefits and expenses.

Table 2: Expedient application of an animal-health system

	Application	Veterinarians (N=79)	Livestock farmers (N=84)
1.	Diagnosis data of the livestock	80%	80%
2.	Diagnosis data of individual animals	79%	80%
3.	Connecting animal health data with data of the milk yield recording	73%	64%

Veterinarians assume obstacles to an integrated animal-health system to be a lack of customer acceptance, a lack of knowledge, technical problems and doubts concerning data security.

5 Conclusion and Outlook

The results of the survey of livestock farmers and veterinarians confirm acceptance of linking animal-health-data with the data of the milk yield recording. Both interest groups assess the diagnosis data of livestock and of the individual animal as important for the improvement of animal health and livestock production.

In the face of an IT-based animal-health system, all participants should have similar IT-technical standards and knowledge to enter the animal-health system. At the moment, veterinarians seem to lag behind. Information, consultation and training in user-oriented IT-themes are required. Specific attention should be given to the aspects of data security and access rights.

The next step is a survey in the north of Germany, to verify the results of the surveys in Baden-Württemberg. Different structural conditions exist in the north and south; farms in the north tend to be more specialized enterprises, while their southern counterparts tend to be smaller and family run. Furthermore, the target groups will be expanded by including administrative institutions. To evaluate our activity with respect to integrated animal-health systems, there will be a screening and an analysis of analogous developments abroad. In a broader view this project can have impacts on traceability, quality assurance, and food safety and improve production management and stock monitoring.

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