THE STRATFEED PROJECT: A EUROPEAN INITIATIVE TO TACKLE THE PROBLEMATIC DETECTION OF MBM IN COMPOUND FEED (WP1)

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1 Description of the problem

1.1 Problem: European mad cow epidemic BSE

The production of animal feed is one of the most important activities in agriculture. About 120 million tons of feedstuffs are produced annually in the European Union [**15**]. After various crises including the 'mad cow' epidemic that emerged in 1986 [**16**] and suddenly recurred at the end of 2000, the emphasis was no longer placed on productivity but on the protection of human and animal health. The first documented case of bovine spongiform encephalopathy (BSE; also called 'mad cow disease') occurred in the United Kingdom in 1986. Since then, over 189,000 cases of affected cows have been reported, more than 97% of them in the UK, 2.9% in the rest of the EU and a few cases in the rest of the world, including Canada and Japan. (**Figure 1**).

BSE is a chronic, degenerative disease that affects the cow's central nervous system and is always fatal. Symptoms of this disease are mainly a change in body temperature, abnormal posture and difficulty in standing, lack of coordination, decreasing milk production and weight loss. BSE is one of the transmissible spongiform encephalopathies (TSEs) that affect various mammalian species. Although a number of theories have been put forward to explain the origin and responsible agent(s) of BSE, the prion theory is the one that is most widely accepted.

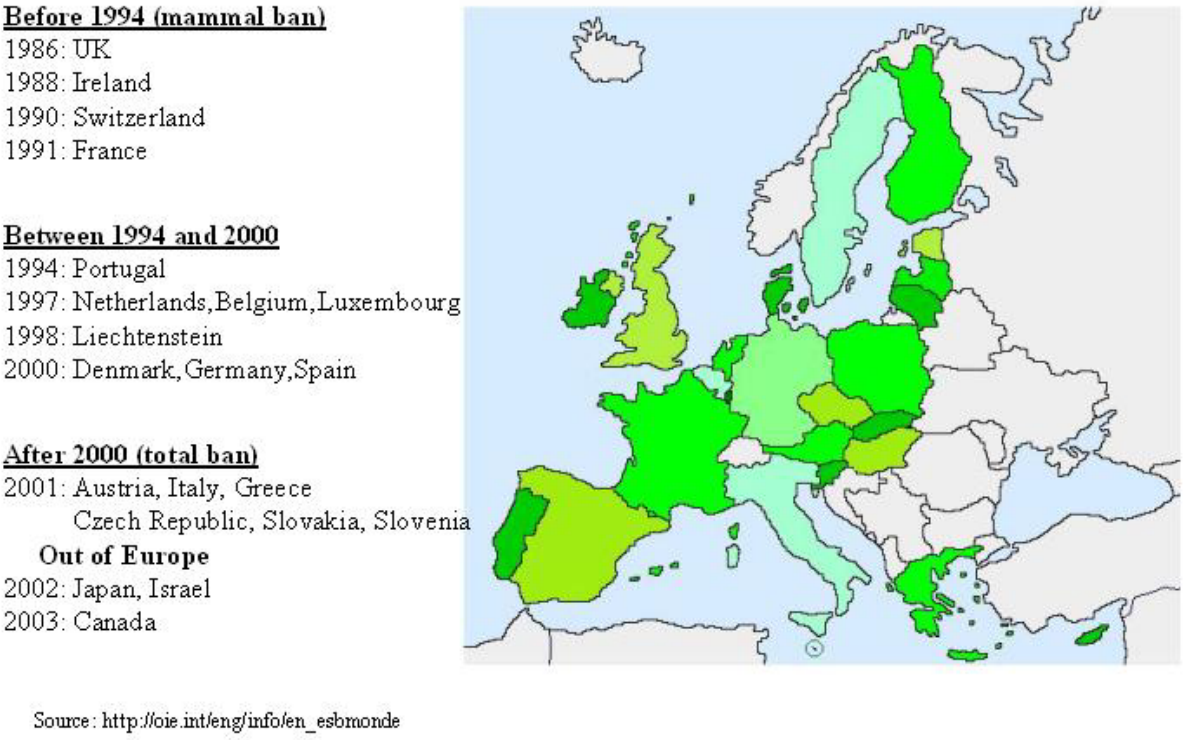

Figure 1.: The first cases of BSE in Europe. (Source: OIE, 2004)

Other TSE diseases are scrapie which occurs in sheep and goats and has been known for several hundred years, feline spongiform encephalopathy which occurs in cats, and chronic wasting disease found in elk and deer and diagnosed for the first time in 1981 in the USA.

1.2 Impact on human health in Europe: nvCJD

Humans are also susceptible to TSEs. Creutzfeldt-Jakob disease (CJD) is a TSE that afflicts humans more than 60 years old and has occurred in one or two people per million per year. After the diagnosis of BSE in cattle, a new variant of CJD was observed and called variant Creutzfeldt-Jakob disease (vCJD). This disease differs from CJD in that it afflicts younger people and has pathological similarities to BSE. Epidemiological studies conducted in the UK have suggested that exposure to BSE may be linked to the new variant form of Creutzfeldt-Jakob disease (nvCJD). In April 2004, over 153 cases of vCJD were reported [**22**], 140 of them in the UK [**30**].

Moreover, epidemiological evidence associated BSE with animal feed containing rendered materials from scrapie-infected sheep. Transmission and spread within cattle herds, though, is most likely to occur by the oral ingestion of feed contaminated with materials derived from BSE-infected cows. The theory of contaminated feed as the major BSE transmission route in cattle is widely supported by epidemiological studies, by rendering studies and by the effect of the feed bans. Contaminated ruminant protein enters the feed chain mainly in the form of meat and bone meals (MBM). MBM has been used to supply essential amino acids to lactating and fast-growing animals. MBM can also be included accidentally or can result from cross-contamination at feed mills, during transport, during storage or at the farm level [**18**].

1.3 European Commission measures.

In order to prevent the further spread of BSE and its human form nvCJD, and to prevent the introduction of contaminated animal proteins in the feed chain, various pieces of European legislation have been introduced and implemented. The first piece of legislation (94/381/EC), relating to the ban (mammal ban) of the use of protein derived from mammalian tissues in ruminant feed, was introduced in 1994 [**7**]. In 1996, legislation 96/449/EC specified that mammalian by-products had to be pressure-cooked when processed into MBM for feeding animals intended for food production [**9**]. In 1999, legislation 1999/534/EC (repealing 96/449/EC) specified the restrictions on the production of MBM and tallow [**12**]. After the mammal ban, a total ban on feeding processed animal proteins to farmed animals kept for food production was temporarily introduced (2000/766/EC, implemented by legislation 2001/9/EC) and then the transitional nature of the feed ban was ended by legislation 1234/2003 (amending legislation 999/2001) [**14**].

The total ban was introduced throughout the EU because of the inadequate feed controls introduced by the first ban in 1994. This partial ban created the risk of cross-contamination of ruminant feed with mammalian feed, as evidenced by a general increase in BSE cases at the end of the 1990s (also called the 'second BSE crisis'). This was observed in various European countries, including several that formerly thought they had no significant BSE problem. In particular, cross-contamination between ruminant feed and feed containing processed animal proteins intended for other species frequently occurred. This was revealed by inspections carried out by the Food and Veterinary Office (FVO) and by the appearance of several thousand BSE cases born after the first EU-wide feed ban introduced in 1994. The FVO reports showed that cross-contamination of ruminant feed in most EU Member States was recognised to result mainly from (i) a failure to adequately monitor the feed ban (lack of a validated species-specific method to test the presence of ruminant MBM, insufficient sensitivity of the applied methodology, and small number of samples analysed) and (ii) the problematic implementation of measures by Member States (lack of rigour and consistency in implementation within and between Member States, and establishing dedicated feed mills in all Member States to process feed for ruminants and non-ruminants separately) [**18**]. **Figure 2** shows the annual evolution, for 2000–2003, in the age of the BSE cases in France. Affected French cows are, year after year, older, demonstrating improvements in the implementation of the BSE ban.

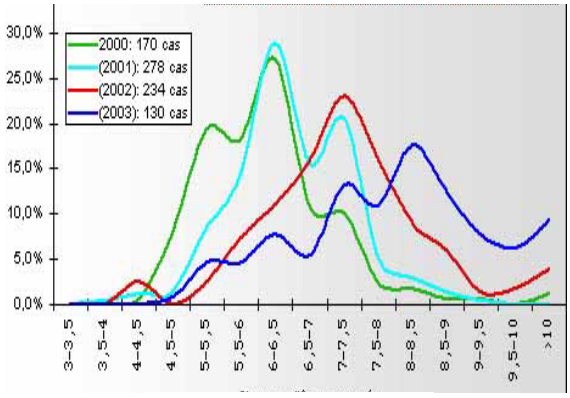

*Figure 2. : Year of birth from 2000 to 2003 related to BSE cases detected in France. [Source: Pierre Lavie [**23**]]*

During the 1994–2003 period, other countries such as Japan introduced a similar ban. Some countries, such as Canada and the USA, have introduced a ban similar to the partial ban introduced in the EU in 1994 and restricted the use of ruminant proteins for cattle.

In addition to processed animal protein (PAP)[1] legislation, the EC banned intra-species recycling (cannibalism) through the so-called animal by-product (ABP) legislation (1774/2002; 811/2003) [**13**]. The theoretical basis of this is that intra-species recycling of animal material will, because of the absence of a species barrier, increase the risk of cases occurring or undetected infectivity pools developing if potential TSE-contaminated material is recycled to ruminants or (possibly) to susceptible non-ruminants.

1.4 Economic impact in the European Union.

In the long term, BSE feed controls across the EU could be confined to a ban on feeding mammalian-derived protein to ruminants and compliance with the prohibition of cannibalism. **Table 1** summarises the prohibited, derogated and non-prohibited uses of the various animal by-products according to the purpose of the feed produced [**6**]. The current ban includes a ban on feeding fishmeal to ruminants as the EC considers that cross-contamination with mammalian MBM may occur.

[1] According to article 1 of Decision 2000/766/EC, PAPs are defined as meat-and-bone meal (MBM), meat meal, bone meal, blood meal, dried plasma and other blood products, hydrolysed proteins (HP), hoof meal, horn meal, poultry offal meal (PM), feather meal, dry greaves, fishmeal (FM), dicalcium phosphate (DCP), gelatine and any other similar products including mixtures, feedingstuffs, feed additives and premixtures, containing these products.

Table 1: Prohibited, derogated and non-prohibited uses of various animal by-products according to the purpose of the feed produced. (March 2004)

Type of animal by-product		Feed intended for: Ruminant	ruminant (e.g. pig,	Poultry	Fish	Pets
I	MBM, meat meal, bone meal, hoof meal, horn meal, poultry offal meal, feather meal, dry greaves.	■	■	■	■	
II	Bloodmeals, blood products, gelatine and HP (other than hides and skins) of ruminants	■	■	■	▒	
III	Bloodmeals, blood products and HP of non-ruminants	■	■	▒	▒	
IV	Fishmeal	■	▒	▒	▒	
V	HP of ruminant hides and skins	■	▒	▒	▒	
VI	HP of non-ruminant tissues	■	▒	▒	▒	
VII	DCP and TCP of animal origin	■	▒	▒	▒	
VII I	Gelatine of non-ruminant	■	▒	▒	▒	
IX	Milk, milk products, colostrum	▒				
X	Eggs and eggs products	▒				

Legend: MBM = meat and bone meal, HP = hydrolysed proteins, DCP = dicalcium phosphate, TCP = tricalcium phosphate, ■ = prohibited, ▒ = derogated, ... = non-prohibited. (Source: De Smet, 2004[**6**])

PAP and ABR legislation needs reliable analytical methods in order to ensure the correct implementation and application. More precisely, this legislation needs, first, control methods to find the heat-treated mammalian proteins in compound feed and the presence or not of other non-pressure cooked fish or poultry proteins. For instance, the key to any future relaxation of EU controls on the use of fishmeal in ruminant feed is the development of an effective, validated test at European level, able to assess whether or not the fishmeal is free of contamination by mammalian protein.

PAP regulations stipulate that there is zero tolerance regarding the presence of processed animal proteins in feed.

However, it is generally accepted that an analytical method should show sufficient sensitivity at a concentration of 0.1% with a rate of false positive value inferior to 5% [**19**]. ABP regulations also require analytical methods to detect the presence of species-specific processed animal proteins (e.g. poultry, pigs). The potential adapted methods also have to take into account the extreme conditions required to produce some of the processed animal by-products (20 min., 133°C, 3 bars). **Figure 3** presents a simplified generic process description [Woodgate, 2002]. There are two processes used in European rendering plants: the continuous process and the batch process.

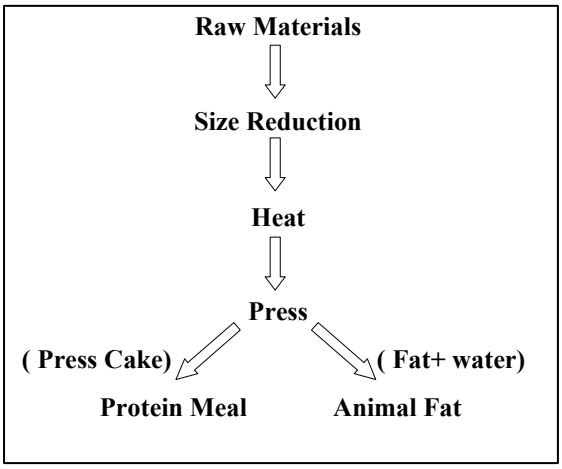

Figure 3 Simplified generic process description of the production of protein meal and animal fat in the rendering process. [Source: Woodgate, 2002]

Once the animal by-products regulation is supported by efficient control tools ensuring the exclusion of species-specific animal proteins in compound feed and the correct application and implementation assured, it will be possible to reconsider the current extended ban. A revised ban will lead to a species-specific ban that will not affect consumer protection. An important point is that the species-specific ban will reduce the severe economic impact of the actual ban. By-products represent about 46, 38 and 32% of bovine, pig and poultry production, respectively. That means an annual production of 3 10^6 tonnes of MBM to 1.5 10^6 tonnes of animal fat. The cost of the total ban is estimated to be € 5.2 bn per year. This is distributed between the loss of the added value of the by-products for the farmers, the cost of replacing the by-products by other feed ingredients, and the cost of disposing of all animal by-products.

2 A European initiative: the STRATFEED project

To contribute to the implementation of Commission decisions and reduce the economic impact of a total ban on the use of MBM, it was clear that a research project at the European level had to be built: STRATFEED answers that need

The STRATFEED project was submitted by CRA-W in 1999 within the framework of Topic II.14 of the Growth-Dedicated Calls-10/99 entitled 'New methodologies for the detection and quantification of illegal addition of mammalian tissues in feedingstuffs'. This topic was directly related to the R&D activity 'Fight against Fraud (R&D)' under the Competitive and Sustainable Growth Programme in the 5FP. It fell under the generic activity 1.1.3-6 Measurement and Testing. Specifically, it was related to the Objective 1.1.3-6.2 Methodologies for Measurement and Testing. The aim of this dedicated call was to have, at European level, efficient methods and tools to strengthen control over the addition of MBM to compound feed. This had to support the control of the application of the Commission Decision 94/381/EC in June 1994 banning the use of protein derived from all mammalian tissues in compound feed destined for ruminants.

The STRATFEED project was first elaborated to address the scientific and technological objectives described by the supporting document Topic II.14. The proposal aimed to provide reliable control

of the ban on ruminant ingredients in ruminant feed and had to improve the safety of food supply with respect to BSE and similar problems. With efficient methods, the implementation of directives and decisions should be facilitated. The project has to result in significant healthcare benefits for the EU. The development of new methods to detect the addition of illegal ingredients has to keep pace with unscrupulous practices. After several crises affecting the feed and food sectors, there is a great need to rebuild consumer confidence in safe and high-quality European products.

Further to the Commission Decision 94/381/EC, several other Commission decisions, EU Directives and international legislation, such as non-tariff barriers under GATT and WTO agreements, have included provisions for the circulation, trade and inspection of food and feed materials. In particular, Directive 98/67/EC [**10**] refers to, *inter alia*, the need for a description of each product, the chemical analysis and compulsory declaration. In order to give the consumer clear and accurate information, provisions concerning the labelling of compound feedstuffs have been established by Directive 79/373/EC and the amendment introduced by Council Directives 96/24/EC [**8**]. Rules have also been drawn up concerning the declaration of ingredients in compound feed. All these measures, and those discussed earlier in this chapter, are based on a commendable principle –the protection of animal and human health, and the effective functioning of the market through removing trade distortions and ensuring favourable commercial conditions.

During the project, the European legislation has been greatly modified, moving from a ruminant ban to a total ban and, recently, considering a species-specific ban. The STRATFEED consortium has taken this evolution into consideration and has adapted the development of the methods to suit to the new analytical challenge.

3 Objectives of the STRATFEED project

Controlling the application of the regulations calls for accurate, precise and reliable methods to be at the legislator's disposal. Thus, the ruminant ban on the use of mammalian tissues, and later the total ban, called for analytical methods to prove the absence of illegal products in feedstuffs. The classical microscopic method is currently the only official method accepted throughout Europe. It is based on the microscopic identification and estimation of sieved and decanted fractions of particles of animal origin in feed It is dependent on the experience of the analyst, and there are still problems with it in terms of, for instance, (i) detecting MBM in the presence of other species (e.g. fish, poultry) or other animal by-products (e.g. feathers), and (ii) differentiating between mammalian and poultry bones.

3.1 Improving the classical method.

The first objective of the STRATFEED project was to harmonise and improve the efficiency of the control using the official microscopic method [**11**]. The results of a collaborative study conducted in 1998[**5**] emphasize the need to harmonise the method in order to improve its repeatability and reproducibility in European control laboratories and to fine-tune it for the optimal identification and quantification of MBM in compound feed. The STRATFEED proposal aims to solve these problems using various original and complementary approaches and solutions, including constructing a European microscopic database (carrying images of feed ingredients, MBM, fish meals, etc), setting up an Expert System involving decision-making rules for the recognition of ingredients by classical microscopy, and

elaborating an efficient protocol for the quantitative measurement of animal meal in feedstuffs. The process of documenting microscopic images requires a great amount of information, which can be collected from the analysis of morphological and chromatic traits of particles or of particle parts or digital images. Since the examination is visual, the results depend on the analyst's knowledge of the ingredients' features and the application of the microscopic technique. Although there are many material descriptor lists (of ingredients of feedstuffs) based on international agreements, the interpretation of these lists is subjective and the documentation of morphological characteristics depends on the expertise of the specialist [**21**]. This information in databases is helpful if well managed but often the textual interfaces proposed to the users do not help them avoid inputting erroneous data. The microscopic image database linked with an adequate Expert System and the Internet site should be a highly valuable tool for the control of compound feed.

3.2 Developing new methods.

The second objective of the STRATFEED project was the development and the validation of new methods based on alternative techniques for the rapid, precise and reliable detection and quantification of animal meal in feedstuffs. Several papers at a European workshop in 1998 on the 'Identification of animal ingredients in compound feed focusing on the microscopic method for identification', organised by the CEMA group, highlighted the potential of various methods for identifying animal ingredients in compound feed. The developments and research at the time the STRATFEED project was submitted for financing (2000) showed the potential of enzyme-linked immunosorbent assay (ELISA) [**20**], polymerase chain reaction (PCR) [**1,4,27**], near-infrared reflectance spectroscopy (NIRS) [**17,24,28,29**], differential scanning calorimetry (DSC) and near-infrared microscopy (NIR spectro-microscopy) techniques [**2,26**]. The STRATFEED project included the development of a strategy based on PCR, NIRS and NIR spectro-microscopy techniques. The choice of these techniques was determined by their complementarity.

The DNA technology (PCR) allows the detection of taxon-specific DNA sequences from a number of heterogeneous matrices. By using tPCR-based procedures and appropriate primer pairs, the technology allows a rapid and sensitive detection of taxon-specific DNA-sequences from MBM [**3**] to be made. The STRATFEED proposal aimed at developing a PCR method for detecting illegal addition and for differentiating material from mammalians and poultry. The differentiation using classical microscopy is very difficult and less reliable.

The NIRS technique meets all the criteria in terms of speed of response, reliability, cost-effectiveness and fitness for a radically new approach to assessing raw materials and finished feed products. It can analyse a sample in a few seconds, even for multiple constituents, and, importantly, it is non-destructive. Various studies have shown that NIRS can predict instantly the percentage of MBM. It is a practicable methodology for the industry, which can be applied for the routine control of the gross volume of feedstuffs marketed in Europe. When integrated into any official trade quality control system, NIRS will enable the number of samples being analysed to increase and will provide an instant method for detecting and flagging suspect materials.

NIR spectro-microscopy involves the analyses of several hundred particles, produced by grinding a compound feed. Determining whether these particles are MBM particles or not is done by

comparing their spectra with reference libraries. The great advantage of this technique is that recognition does not depend on the analyst's expertise; it is possible to automate all the procedures and to analyse twice as many samples per unit of time compared with the classical feed microscopy. The area proportion of MBM particles is converted into the MBM percentage in the compound feed. The STRATFEED project aims to establish an NIR spectro-microscopy method for the rapid and reliable detection and quantification of animal meal in feedstuffs.

3.3 Sample bank and database.

Since December, with the application of the total ban on using MBM in feed destined for farm animals, it has been very important to collect existing samples to use them as reference samples to develop and test the new detection methods. The STRATFEED project aims to build a European sample bank of feed ingredients, MBM, and feedingstuffs with and without animal meal.

The sample bank aims to conserve feed materials and feed samples under stable conditions, and to distribute these samples to the laboratories for analysis. It is important that the samples do not deteriorate or get lost, because they carry important information and a high value. Thus, it is important to optimise the conservation conditions and to keep good records on each sample. The STRATFEED project covers all these aspects.

To manage the multidisciplinary nature, the international partnership, the quantity of information and the huge mass of analytical data, STRATFEED aims to develop a global Internet-based system. This system will include open and closed websites, a samples description database, a microscopy pictures and spectra database, query modules to explore the data, and a decision-support system for classical microscopy.

4 Management overview of the STRATFEED project

4.1 The Work Package structure.

The STRATFEED project structure is centred around seven Work Packages (WPs) (**Figure 4**). These WPs are devoted to: managing the project (WP1); developing a sample bank and preparing the sample sets analysed during the project (WP2); improving and developing methods (WP3, WP4 and WP5); constructing an Internet site and a European database (WP6) and implementing a validation plan (WP7). The tasks involved in WP7 (follow up on method development, method validation, organisation of collaborative studies) will ensure the development of robust methods.

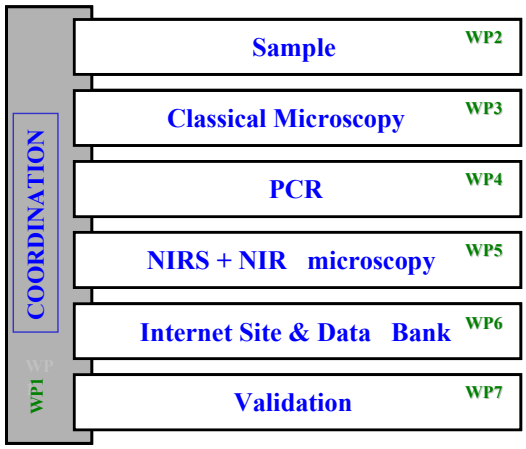

Figure 4: General structure of the STRATFEED proposal

4.2 The consortium and the collaborators

The consortium presenting the STRATFEED proposal included 10 partners (official laboratories, research centres, universities and one private company) from five EU countries involved in the control of compound feed, the development of new methods, the validation of these methods and the application of the methods to the industry.

During the project, it was decided to enlarge the consortium, and three new institutes were invited to join STRATFEED and share the experiences in classical microscopy in countries not yet represented in the consortium: the Swiss federal research station for animal production, the Institute LWK-LUFA in Germany, and the Danish Plant Directorate. By the end of the project the STRATFEED consortium included 13 partners from 8 countries. **Figure 5** presents the composition of the initial consortium.

Apart from this consortium, various collaborators have been involved in the carrying out some tasks. Rendersur, Serida and Cap from Spain contributed to the project by sending to UCO samples of meat meal for the sample bank and providing the description of their composition. The European Fat Processors and Renderers Association (EFPRA) contributed provided samples and developed a joint strategy to promote the best possible valorisation of animal proteins. The Expert Center for Taxonomic Identification (ETI) in The Netherlands contributed to the project by providing the Linnaeus II multimedia data entry software to develop the ARIES Decision-Support System.

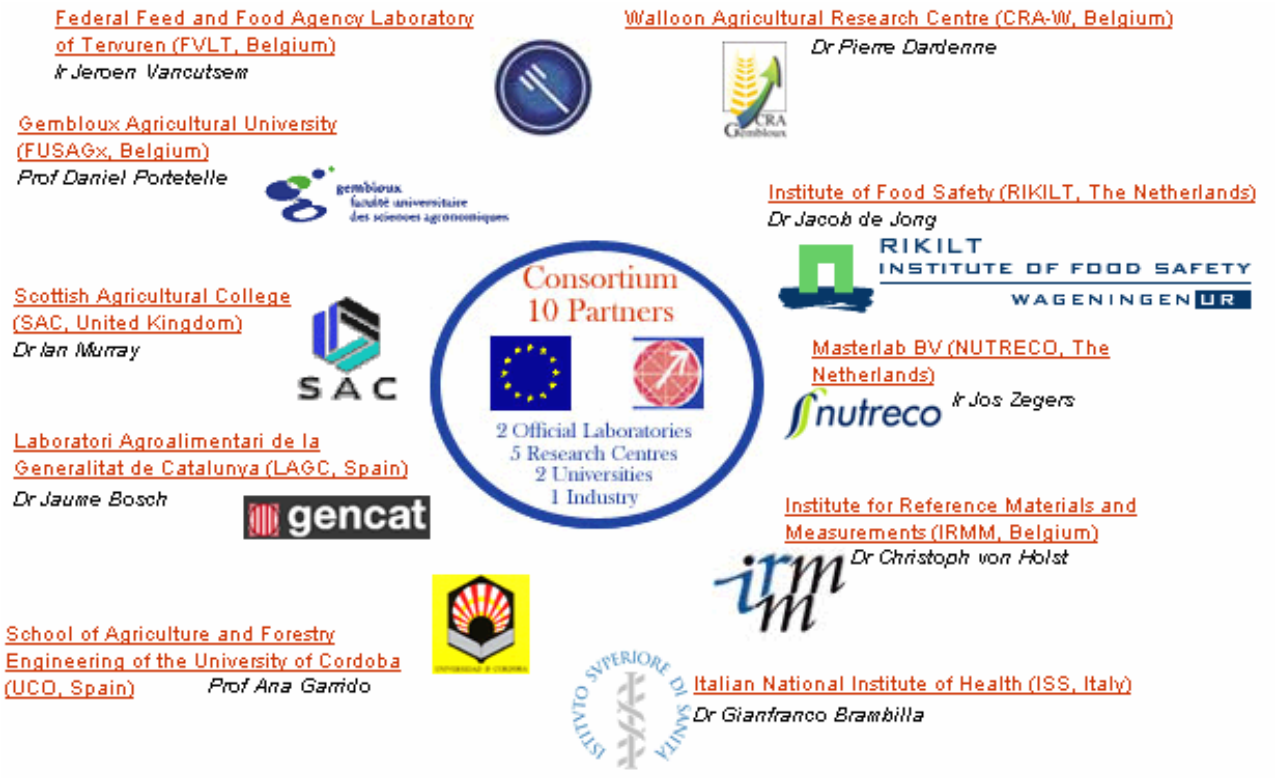

Figure 5: The STRATFEED consortium.

4.3 Meetings.

Six internal project meetings were organised: the kick-off meeting at CRA-W in Gembloux on 12 January 2001, the second meeting at LAGC in Barcelona on 22–23 November 2001, the third one at RIKILT in Wageningen on 1–3 July 2002, the fourth one at ISS in Rome on 6–8 November 2002, the fifth one at SAC in Aberdeen on 14–16 May 2003 and the sixth one at JRC-IRMM in Geel on 10–12

March 2004. Each meeting gave partners the opportunity to present a progress review of their work. Usually, one day was devoted to working sessions to discuss specific problems linked to each WP. A second day was taken up by the plenary meeting, where each WP was reviewed by each leader.

In addition to the consortium meetings, various extraordinary meetings were organised by the STRATFEED partners.

In September 2001, a meeting was held in Wageningen (RIKILT) by the WP3 partners to work on formulating a protocol, including a checklist for the observation description.

In March 2002, the PCR group (WP4) held a meeting in Brussels (CRA-W) to discuss the various approaches used by each partner and to plan the work for the following 10 months.

At the beginning of March 2002, a workshop on rendering processes and the analytical methods for determining animal tissue in feed was organised at Ispra (JRC-IHCP). It provided an opportunity to discuss this issue with representatives from EFPRA.

Between 2002 and 2004 several meetings were organised with EFPRA and European representatives of DG-SANCO. On 20 September 2002, in Brussels, Pierre Dardenne and Vincent Baeten presented the project to DG-SANCO. On 5 November 2003 a workshop was organised in Geel by JRC and CRA-W with EFPRA, to discuss suitable markers for various types of animal by-products and to learn about recent developments in immunoassay applicable to detecting MBM in feed.

Apart from these project meetings, STRATFEED organised meetings with the European Commission or local authorities during this period.

The progress of the project was presented to the CEMA (Committee of Experts on Methods of Analyses) group.

On 11 October 2001, in Gembloux, Pierre Dardenne presented the project to the European research commissioner, P. Busquin *(***Figure 6**)

Figure 6: Busquin's visit to the CRA-W on 11 October 2001.

On 6 December, in Brussels, Pierre Dardenne was invited by Elke Anklam to present the STRATFEED project at the 'JRC Information Day in Belgium. Science and Technology in Support of Policies.

On 2 May 2002, in Seville, UCO presented the project to the Andalusian scientific committee for BSE.

On 18 and 19 June 2002, in Warsaw, Vincent Baeten presented a poster on the project at the conference 'Towards an integrated infrastructure for measurements'.

On 6–11 April 2003, in Cordoba, Spain, at the 11th International Conference on Near Infrared organised by the Department of Animal Production from the Faculty of Agriculture and Forestry Engineering of the University of Cordoba (UCO), four posters on the STRATFEED project were

presented by Ian Murray (SAC), Lola Pérez Marìn (UCO), Silvia Thermes (LAGC) and Vincent Baeten (CRA-W).

On 6 October 2003, in Brussels, Belgium, there was a meeting of national experts to discuss the details of the new protocol that would replace Directive 98/88 (Directive 126/2003/EU). There were several main discussions (for instance, on the embedding agent for the sediment, the glassware for sedimentation [open beakers as well as closed funnels are allowed] and on the French method). The Commission relied heavily on STRATFEED expertise for writing the first draft, and also used our expertise for writing the final draft after the meeting. The Permanent Committee for Animal Feed agreed with the text of the new Directive at their meeting on 20 November.

During the project, the STRATFEED partners also attended international scientific meetings to report on the work of the project. For instance, on 17 January 2003, in Tucson, USA, at a meeting for the detection of animal proteins prohibited in ruminant feed, organised by the Food and Drug Administration / Association of American Feed Control Officials (FDA/AAFCO), Christoph von Holst presented aspects of method validation and Vincent Baeten gave a lecture on the project and on the use of NIRM and IR Camera for detecting and quantifying MBM in compound feed..

5 Conclusions and perspectives

The conclusions given here relate to management issues. The scientific conclusions of this project are given in the last part of this report.

This project has helped create a major European network of laboratories and scientists with expertise in feed. Through exchanges between partners and the organisation of meetings with each country partner, the project has been able to bring together people of different scientific backgrounds to work on a common problem.

Through the exchanges with the authorities, the project enabled the CRA-W coordination team to acquire a better knowledge of European project management.

Regarding the organisation and the management of the WPs, it needs to be noted that the degree to which the partners have worked together greatly facilitated the progress of the project. The STRATFEED consortium was able to adapt to the evolution in the legislation and to changes in STRATFEED staff (incorporation of invited partners) and the European staff (moving of the project officer). Almost all the tasks have been completed as set in the original schedule. The excellent work spirit led the consortium towards carrying out a great deal of work not included in the technical annex of the contract. The additional work focused mainly on designing and conducting new experiments, preparing a high number of samples to be analysed by each partner and organising additional meetings. All the STRATFEED partners were fully involved in the project and made great efforts to tackle the problem of appropriate methods for the total ban of MBM and the likely forthcoming species-specific ban proposed by the Commission. Unquestionably, the experience acquired by this group could be used in future European projects.

To disseminate the results of the project, an international symposium entitled ‘Food and feed safety in the frame of TSE’ was held in Namur, Belgium on 16–18 June 2004. It was organised by the Walloon Agricultural Research Centre (CRA-W) in collaboration with the European Commission’s Joint Research Centre,

Institute for Reference Materials and Measurements (JRC-IRMM), the Food Agency (AFSCA) and the Walloon Agrobiopole (Agrobiopôle). The purpose of the symposium was to provide an overview of the latest scientific achievements in food and feed safety within the context of the prion diseases (TSE). The events included oral presentations, posters and exhibition sessions.

The symposium proceedings are published in the journal *BASE*, (Biotechnology, Agronomy, Society and Environment) in December 2004 [(Vol. 8(4)].

Other ways of disseminating the results include the website (http://stratfeed.cra.wallonie.be), which carries all the results produced by the project, the publications validating the work produced and the activities conducted by each WP as described in the following WP parts, as well as the electronic technology implementation plan.

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