USING INTERNET FOR TRAINING THE MEAT SCIENCE COMMUNITY; ECCEAMST's EXPERIENCE

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Introduction

Since the introduction of Internet, its use has increased explosively. Initially primarily utilised for information transfer in an academic or research environment, it has nowadays penetrated all shifts of society. Applications range from communicating cooking recipes, music and film, to shopping (e-commerce), chatting, conferencing and even experiencing an occasional 'virtual love affair'. Our contribution to this conference obviously focuses on Internet's scope for the academic realm, and highlights Internet's potential for purposes of training, with some emphasis on the current activities and plans of the European Consortium for Continuing Education in Advanced Meat Science and Technology (ECCEAMST).

Before concentrating on the meat sector, it seems useful to provide some information on training networks in general. For this purpose we have in the next section cited condensed elements taken from a publication by Harasim et al. (1997) in which the authors sketch the theoretical framework, present examples of electronic training approaches and discuss the experiences with various modes of Internet training. Where appropriate, we have illustrated these with examples from the Meat Science area.

Various course modes

Network education is increasingly used both for school-based and for post secondary training. In the former the predominant application is 'curriculum enhancement', i.e. it serves as a supplement to regular instruction. This so-called *'adjunct mode'* approach has been or is currently being adopted in many universities and in distance education networking activities. Increasingly, universities publish (part of their) study programmes as well as some course materials on one of their web sites [for an example see Figure 1 taken from Texas A&M (Internet address 'A', under 'References'].

The use of networks for post secondary education shares certain common features with school-based networks but two additional modes are also widely used, viz. the *'mixed mode'* (a significant portion of the face-to-face or distance education class is conducted by E-mail or computer conferencing) and the totally *'on-line mode'* (the network is the primary environment for course discussions). The latter two modes are less common in school-based applications.

Adjunct mode use of networks allows students to communicate with instructors and other students outside normal classroom or office hours and - particularly relevant in distance learning courses - it enhances tutor-student contact. This approach is the most wide-spread form of networking in higher education, used by instructors around the world (e.g. see the 'Veterinary Public Health and Hygiene' course developed by Jay Levine at North Carolina State University (see Figure 1; Internet address 'B' under 'References'). Major advantages are i) that it enables communication when tutors and students want or need to, ii) that the latter is associated with the provision of documented records, and iii) that it improves the quality of the interaction in a more personal student-teacher fashion. The introduction of 'electronic office hours' is very useful at times when this interaction is achieved by way of computer conferencing, i.e. when many questions are of common interest to all students. As the use of internet grows, it is now increasingly being integrated in many universities in course activities, for accessing source material, for connecting peers and experts and for remaining current with the field through on-line journals and newsletters.

In mixed-mode course delivery, networking is fully integrated into the curriculum. It might be used for role-playing and simulation games, where for instance a series of case-studies serve to create an artificial environment in which students experience some of the real-world pressures to which decision makers are subject to. While face-to-face seminars are often restricted to small classes of advanced students, the on-line seminars enable all students to have a voice and participate.

Finally, 'on-line mode' courses typically rely on the use of textbooks and course readings in hard copy. Face-to-face meetings, when deemed necessary at all, are usually reserved for launching the course and building a sense of group identity, and for evaluation. On-line interaction displays fewer of the extremes typical for face-to-face class activity such as excessive or dominating input by a few and little or no participation by everyone else in the class.

Training for the meat sector and the Internet jungle; a 'quick and dirty' survey

A lot of information can be found on Internet. The biggest problem, however, is to find the pathways to useful, updated and reliable information. Using search engines and locating sites simply using the search word 'meat' illustrates this. A host of information can be retrieved ranging from highly relevant and reliable to completely useless or even 'shady'. Much of the available information regards statistics, products information, literature sources, electronic journals, fun/trash etc. Anyone not yet particularly familiar with 'surfing the net' will spend considerable time to retrieve information. More importantly, for a less-educated person to distinguish between sense and non-sense is no small feat. Moderation by a group of experts evaluating the various web sites and making a pre-selection facilitates this process and this has represented a major argument for ECCEAMST to initiate the Meatnet project (see below). On ECCEAMST's Meatnet site (Internet address 'C' under 'References') potentially useful links have been indicated.

Screening internet for offers on training courses in meat science still renders surprisingly little. In the framework of preparing this paper (May 2000), ECCEAMST conducted a quick and dirty survey, feeding search engines with (combinations of) key words such as 'meat', 'course', 'on-line', 'computer aided learning', 'distance learning' etc.. Whilst 'food' as an entry might have been a more successful approach, our results reveal that sites offering electronic courses *specifically* targeted towards the meat sector are hardly

Texas A&M University
Department of Animal Science

Courses

Web-based course materials

Each term, more Department courses publish their syllabi, course outlines and/or related materials on the World Wide Web. The following courses have such information available:

Ansc 108. Laboratory Introduction to Animal Science
Ansc 307. Introduction to Meat Science
Ansc 433. Reproduction in Farm Animals
Ansc 467. Processed Meat Food Operations
Ansc 489. Special Topics in HACCP Systems
Food Sci./Dairy Sci. 326 and 327. Food Microbiology
Nutr 202. Fundamentals of Nutrition

Syllabi

Ansc 433. Reproduction in Farm Animals
Ansc 434. Artificial Breeding of Livestock with Semen/Embryos
Ansc 489. (Nancy Ing) Animal Biotechnology

VMM 944

Veterinary Public Health and Hygiene

Jay F. Levine, Dept. of Microbiology, Pathology, Parasitology
College of Veterinary Medicine, North Carolina State University

On-Line Learning Resource

Lecture 26	*Food-Associated diseases*
Lecture 28,29	*Outbreak investigation*
Lecture 30 :	*Water-Associated diseases* *Seafood associated diseases*
Lecture 31:	*Zoonoses introduction*
Lecture 32:	*Classic Zoonoses*
Lecture 33 :	*Tick and Mite associated Zoonoses*
Lecture 34 :	*Mosquito-associated Zoonoses*

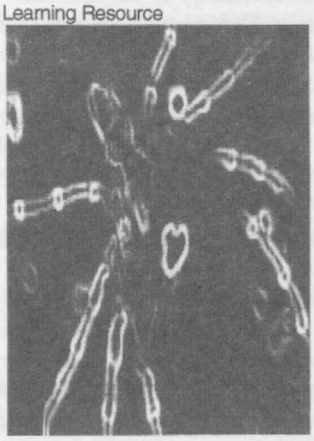

Figure 1: Screen sections from interactive training sites (university-based, "adjunct mode")

FOOD SAFETY VIRTUAL UNIVERSITY
REGISTER FACULTY CAMPUS HOME ROOM INFO
Continuing Education & Distance Learning
Consumer Education
Pathogen Reduction & HACCP Programs
Supervision and Management Studies
Slaughter and Processing Studies
State and Local Studies
International Studies
Compliance and Enforcement Studies
Animal Production Food Safety

Livestock Carcass Disposition Review

Course Dates
August 30-September 25, 1999

About This Course
This course is a 4 week instructor led course which reviews the principles used by the regulatory veterinarian in making decisions regarding the disposition of livestock carcasses in the slaughter plant.

Requirements
Participants must be a veterinarian involved in a food safety role at the federal, state, or local level. The class is limited to 10 participants.

ASI 340

Principles of Meat Science

Course Description

This course is an introduction to the meat industry in which the fundamental properties of muscle structure, chemistry, and physiology are related to meat quality, composition, processing (fresh and cured), nutritional value, safety, and marketing. Nearly every aspect of the industry is addressed and related to these basic properties which are generic and relatively unchanging across all muscle foods.

- General Information
- Course Requirements and Policies
- Instructional Technology
- Exams, Quizzes, Grading Policy
- Course Objectives
- Course Outline

Online Registration

DCE Home Page KSU Home Page (785) 532-5566 or 1-800-432-8222 ©Copyright 1998 Kansas State University All Rights Reserved

Food Hygiene Course

SIK has, in collaboration with the Vocational Council of the Swedish Food Industry, developed a new interactive correspondence course in Food Hygiene specifically for staff working on the production line. The aim of the course is to increase understanding about the importance of good hygiene in production, as well as increasing expertise and quality awareness among staff. The course is adapted entirely for the Internet and all teaching takes place via the screen using a self-instructing pedagogic platform. The course members communicate with each other and the course leader via e-mail.

Course demonstration
Please sample part of the course using the link on the right. It is important that the sound is working on your computer, and that Shockwave Flash and Real Player plug-ins are installed so that the course's multimedia elements work. Go to the blue field on the right for help in doing this.

Modelling Meat Quality
in Pig and Beef Meat

Modelling the formation of PSE meat,

and
the effect of chilling regime
and
the rate and extent of postmortal glycolysis

This course has been produced by
The Department of Food Science, SLU, Ultuna
The European Network
Distance Learning in Food Science & Technology, FIDEL

Figure 2: Screen sections from interactive training sites (postsecondary, `mixed-`, and `on-line' mode)

available. The fact that there is no uniformity in terminology (terms such as 'distance training', 'correspondence course', 'on-line course' etc. are used for essentially the same concepts) might have complicated the screening exercise.

The academic level of the available courses seems to vary considerably. Real on-line courses on university level are rare. An example of post-secondary training for veterinarians involved in a food safety role and with restriction to the number of participants is the Livestock Disposition Course offered by USDA's 'Food Safety Virtual University' (Figure 2, top left; Internet address 'D' under 'References'). Other courses targeting students at various levels and often aimed at industry-employed individuals include for instance i) an interactive 'Food Hygiene' course for staff working in the production line and developed the Swedish Institute for Food and Biotechnology in collaboration with the Vocational Council of the Swedish Food Industry (Figure 2, top right; Internet address 'E' under 'References'), ii) a course 'Principles of Meat Science' developed by Kansas State University's Continuing Education Division offered as an introduction to current or future meat industry personnel, and based on a combination of audio-taped lectures, computer conferencing and electronic mail (Internet address 'F' under 'References') and iii) the course 'Modelling meat quality in pig and beef meat', developed by the Department of Food Science of the Agricultural University of Lund (Sweden) in cooperation with the European Network of Distance Learning in Food Science and Technology (FIDEL) (Figure 2, bottom right; Internet address 'G' under 'References').

Problems to overcome and things to consider when developing and offering Internet courses

Training needs analysis and targeted course design

In ECCEAMST's analysis, the meat industry's work force at large particularly requires training on a less than academic (middle management or work floor-) level. Dealing with 'real-life' situations (for instance the correct handling of specific instruments) is very important. Although some computer-based simulation programmes have been developed to acquire a large spectrum of skills in a 'safe' environment, many elements (specifically the work-floor related ones) can only be learnt via 'hands-on' experience. In these cases Internet courses can at best cover the background theory. In addition, we must confront the fact that, in general, meat industry management is still rather reluctant to grant time and provide facilities for Internet courses especially for the 'blue-collar' level. In other words, would-be course providers are well-advised to do a feasibility study to assess whether or not a particular learning situation is suitable for use of network-operated learning.

When setting out to design and offer a long distance internet-based course it is extremely helpful to be educated on the average target group's characteristics and presumable level of basic knowledge. Unfortunately this information is not always readily available and by consequence course design is often still based on making educated guesses. The latter is particularly ponderous when a training needs analysis of some sort is unavailable. ECCEAMST continually attempts to update its knowledge on training needs, but has observed that there is considerable variation in interpretation of training needs in meat science and technology, pretty much dependent on geographical region/traditions and local training infrastructure. When dealing with an 'open' Internet course offered to individuals with a wide range of backgrounds and geographically spread, the odds of designing a tailored course are even more dim.

The availability of hard- and software facilities and computer skills

As ICT develops, so does societies ability to cope with it. The next generation students will have grown up with interactive computer technology and the current generation already exhibits amazing skills. Hard- and software developments enable increasingly faster processing of information which for instance facilitates the inclusion of more film material to illustrate training elements. However, course participants must obviously be in a position to access and utilise all this: the available computers must have adequate capacity, special software must be installed, the course participant's computer skills sufficient, technical back-up in place to remedy problems etc. At present, some of these factors still represent serious impediments.

The 'course moderator' issue

Probably one of the most important considerations when offering an interactive internet course is that a course leader ('facilitator') should be available. This individual moderates the discussion and provides important feed-back to the course participants. Given that participants in a 'long-distance' course generally come from a variety of backgrounds, it is crucial that the moderator appreciates their basic training background. This not only serves to deal with their ability to communicate on a certain level but also to fine-tune course contents in accordance with the expected learning results. To avoid disappointments at an early stage, the course objectives need to be clearly stated and the methodologies used clearly communicated. The candidate-participant must be made aware of the required time-input, possible assignments and intensity of participation in general. This is all the more important as (with the current general level of technology but more particularly its availability) face-to-face contact between course participants and moderator is problematic. This dictates a mode of communication still rather unfamiliar to most of the traditional teachership.

It has been observed that participants are often reluctant to send in their comments or to actively participate in ('plenary') discussions. Often the feeling prevails that a contribution will be magnified by putting it in writing. Once documented and delivered to the discussion forum it cannot easily be rectified. On the other hand, discussing issues over Internet while 'hiding behind a computer' is usually more comfortable for individuals who have difficulties talking in front of large groups. Hence, besides facilitating the course and leading the discussion, the course moderator has an important role in making the participants feel at ease and enabling and stimulating interaction between course participant and moderator on a one-to-one basis. It can be helpful to split up in smaller subgroups to encourage the discussion and create a 'group-feeling'. This is generally regarded useful as the moderator/tutor will then be in a better position to activate passive participants in an early stage, and prevent individuals with a less forward nature from remaining 'silent'. The discussions generated can be saved in a data-base for later retrieval and editing, should the latter be deemed useful.

On 'on-line' discussions

Internet discussions which are conducted over an extended time period are not very lively and usually have less impact in terms of training. Firstly, in anything less than a truly 'on-line' communication mode, answers to questions raised reach students with considerable delay. Especially prompted by language problems students and moderator tend to take ample time to react. Hence, interventions are generally better formulated but the degree of interactivity suffers. Many would-be course developers expect much more 'liveliness' from on-line discussions. Yet, there are a number of complications. Firstly, there is the time-lapse between writing a response and its publication on the Internet discussion forum. Although usually not more than a few minutes, even this delay has a clearly negative effect on the smooth flow of communication. Therefore, an on-line event has a much lower impact than face-to-face discussions or audio/video conferencing where communication is more direct and 'natural'. Conversely, provided a skilled moderator is available and the discussion is carefully monitored, the on-line mode offers better opportunities to prevent monopolisation of a discussion by some members of a discussion group. In addition, any language-related communication problems are more readily reduced.

In on-line events one usually observes a rapid decline in the number of participants in a discussion when they live in different time zones. Therefore, it is crucial to carefully select an appropriate time for staging on-line events. Particularly for courses addressing target groups in more than one geographical region, this can be very difficult. Also, once date and time of an on-line event have been set, it is advisable to stick to these to promote a sense of reliability. Any last-minute changes cause the drop-out percentage to increase considerably. In this context it should be stressed that for a sufficient degree of interactivity one needs a critical number of participants to change the dynamics away from a teacher-dominated presentation toward a peer group learning situation.

Participants' motivation

A long-distance educational exercise requires more motivation from the part of the participant than is the case in a classic classroom setting. Sitting behind a computer, scrolling through large amounts of text or participating in abstract discussions can be rather frustrating. When restrictive measures [e.g. accreditation of a course only under the condition of demonstrable ('active') participation and/or successful completion of assignments] forms an essential part of a course's graduation system, this adds to the pressure and does not necessarily contribute to *personal* motivation. What usually does, is a well-structured, visually appealing and accessible course design. More importantly, when individuals follow a course upon instigation or demand of their employers, a reduced work load will motivate enormously, as will topical course elements having immediate pay-off in terms of job advancement.

Accreditation

As long as the end-user (i.e. both course participants and their employers) cannot be convinced that impact of graduation from an internet-course justifies the time and money invested, this mode of education will not be considered an alternative for classical approaches. The very nature of the electronic highway implies that courses offered over Internet have an international character and this suggests that accreditation relies on the evaluation by independent, preferably internationally recognised (umbrella) organisations. Provided a course addresses clearly demonstrable training needs, its academic level and quality of moderation is assessed by an expert body, and finally a dependable examination and grading system is in place, Internet-based courses may in the near future replace many of the traditional teaching systems.

ECCEAMST's experience: the 'Meatnet' project

ECCEAMST is a network of Universities, Research Institutions and Industry instituted in 1990 with considerable EU support and primarily aiming at furthering knowledge transfer and training in Meat Science (for general background information on ECCEAMST see: Smulders, 1995, or visit ECCEAMST's Meatnet Web site (Internet address 'B' under References).

The List server 'Knowledge transfer in Meat'

One of the easiest forms of knowledge transfer involving Internet is a List server discussion group. Over E-mail a number of persons are subscribed to the forum. ECCEAMST has gained considerable experience with this communication mode through its 'Knowledge Transfer in Meat'-list. Initially this list was created to discuss with the different partners in the Meatnet project the desired contents of the Meatnet web site. Once the List server was established, it was also used to pass on relevant information to the various persons involved. As the list got more known, also persons not directly included in the project partnership subscribed. This gave a further dimension and initiated most interesting discussions. Gradually, subscribers from different sectors in- and outside Europe but all with a vested interest in meat-related topics joined the group.

Moderating such a list was progressive 'learning-by-doing': e.g. without sufficient moderation there was absolutely no system in the messages circulated. Those messages that primarily pertained to subscribing or unsubscribing to the server needed to be separated from those aiming at knowledge exchange. It soon became clear that a relevant message should be indicated as such by including a subject line in the message's title preceded by MNT:/. Also, in a further attempt to prevent overflowing of mailboxes we soon learnt to formulate the message's title so as to clearly reflect its contents, leaving it to the subscribers to either scan or immediately delete a message. ECCEAMST chose to give the messages a special touch, by addressing individual subscribers personally when appropriate, by introducing the subjects and by always clearly stating the source of the message. A few typical examples of issues addressed on the List server can be found in Figure 3.

The 'Meatnet' web site

The Web site 'Meatnet' was created with support of the EU's Leonardo da Vinci programme. Its intention was to provide information to the European meat sector and assist in finding one's way through the Internet jungle. During the initial stages of the project, the use of Internet was mainly restricted to universities and research institutions. However, as the project developed the use of Internet expanded rapidly. Through discussions with the various project partners Meatnet's content was shaped (see Figure 4).

Date: Mon, 21 Feb 2000 13:33:17 +0100
Reply-to: KNOWLEDGE TRANSFER IN MEAT <KNOWLTRANSFMEAT@NIC.SURFNET.NL>
From: "K.de Balogh" <Balogh@vvdo.vet.uu.nl>
Subject: MNT:/LISTERIOSIS - FRANCE
To: KNOWLTRANSFMEAT@NIC.SURFNET.NL

The following messages were taken from Promed (KdB) LISTERIOSIS - FRANCE
****
A ProMED-mail post
<http://www.promedmail.org>

[see also:
Listeria monocytogenes (GIDEON) 970826111223]]

Date: Sat, 19 Feb 2000 07:36:11 -0500
From: Lynn Caporale <caporale@usa.net>
Source: News media, 19 Feb 2000 [edited]

PARIS - A mysterious outbreak of listeriosis has killed seven people in France over the past few weeks, Health Minister Jean Glavany said Saturday. Glavany told reporters the dead were among 23 people affected by the disease which is caused

Date: Mon, 6 Mar 2000 13:48:48 +0100
Reply-to: KNOWLEDGE TRANSFER IN MEAT <KNOWLTRANSFMEAT@NIC.SURFNET.NL>
From: "K.de Balogh" <Balogh@vvdo.vet.uu.nl>
Subject: MNT:/ some Websites
To: KNOWLTRANSFMEAT@NIC.SURFNET.NL

Dear subscriber,
Here some Websites:

1. Information on the recent BSE case in Denmark can be found on:
http://www.foedevaredirektoratet.dk/nyheder/bse/sac_madcow.html

2. Press release about HEALTH WARNING OVER LISTERIA OUTBREAK IN FRANCE
issued by the UK Department of Health:
http://pipe.ccta.gov.uk/coi/coipress.nsf/70e1fa6684c1d3f380256735005750fb/b0 3df91a995b008b8025688f00449f21?OpenDocument
An interesting Website:

Food Safety and Hygiene: a bulletin for the Australian food industry
http://www.dfst.csiro.au/fshlist.htm

Date: Mon, 18 Oct 1999 09:51:37 +0100
Reply-to: KNOWLEDGE TRANSFER IN MEAT <KNOWLTRANSFMEAT@NIC.SURFNET.NL>
From: "K.de Balogh" <Balogh@vvdo.vet.uu.nl>
Subject: Re: MNT:/ GMO in meat (3)
To: KNOWLTRANSFMEAT@NIC.SURFNET.NL

Date: Sun, 17 Oct 1999 20:50:31 +0100
X-Accept-Language: de,en,fr,es
To: "K.de Balogh" <Balogh@vvdo.vet.uu.nl>
Subject: Re: MNT:/ Genetically modified meat
X-Sender: 0922176588-0001@t-dialin.net
From: kohonikel@t-online.de (Karl Otto Honikel)

to Roberto's question:
Indeed it is most likely that small pieces of a few hundred base pairs of GMO DNA pass through the intestines and appear in the cells. We try to verify at the moment a similar experiment which we did. We found BT-Maize constructs in chicken muscle after feeding. Similar observation have been observed by molecular biologists with mice. The short pieces of DNA however will be not expressed into proteins as the investigating biochemists claim.

Regards Karl

From: Self <EDVZNOVELL2/I108CHEF>
To: KNOWLTRANSFMEAT@NIC.SURFNET.NL
Subject: Re: MNY:/High Voltage Electrical Stimulation
Date: Wed, 5 Apr 2000 11:20:49 +0200

Dear Declan

About your request on high versus low electrical stimulation. I would contact John Thompson and Aub Egan (University of New England, Armidale, NSW 2351 Australia). I had the pleasure of reviewing a PhD Thesis by In Ho Hwang dealing a.o with the effects of high versus low ES on beef tenderness. I believe this is the latest info available.

Keep up the good work

Frans Smulders

Figure 3: Sections of typical communications via ECCEAMST's Listserver

HOME

INDEX OF

MEATNET

Assisting to find your way around the INTERNET on issues related to meat

WHAT'S NEW!

- **What is ECCEAMST?** — History and background information on the European Consortium for Continuing Education in Advanced Meat Science and Technology
- **What is MEATNET?** — Background and objectives of MEATNET
- **The ECCEAMST membership** — Information on membership benefits and fees, how to become a member
- **ECCEAMST Newsletters**
- **ECCEAMST National Representatives** — Names and full addresses of ECCEAMST National Representatives
- **WHAT'S NEW!** — What's new on MEATNET and What's new in and for the meat sector

Activities and Services:

- **MEATNET Databases** (for ECCEAMST members only) — Access the databases relevant for students and researchers in the meat sector. Please have your password and login ready
- **Training Activities** — List of training courses given by ECCEAMST. Repetition of these courses possible on request. Announcement of ECCEAMST courses
- **Books and Publications** — List of ECCEAMST books and publications, prices and order procedures. ON-line ordering.
- **Knowledge Transfer in Meat, discussions** — Discussion group on training and information needs in the meat sector through a listserver. Subscribe here
- **Frequently Asked Questions (FAQ)** — Answers to general questions on meat related issues
- **Upcoming Events** — List of events of interest to the meat sector; conferences and trade fairs, demonstrations, courses etc. Organisers of events can submit their announcements.
- **Article Reviews** — Articles appearing in various journals for the meat sector reviewed.
- **Audio-Visual Training Material** — Inventory on available audio-visual training material of use to the meat sector
- **Employment Opportunities** — List of vacancies in industry, research and training institutions, related to meat
- **International Student Exchange Programme** — Students looking for an internship; and placement offers in the meat sector
- **Training in Health and Safety at Work in the Meat Industry: the 'TOSH-MEAT' project** — Introduction of the project. Project results on MEATNET: The "Inventory of occupational safety and health (OSH) learning materials", and the "Report *"State of the art on Training and Health and Safety at work in the European Meat Industry"- Overview of 10 European countries* - Consolidated report, Final version, May 1998
- **Other Websites** — Direct links to other relevant Websites are provided here, with a short description of each site.
- **New ECCEAMST projects coming up** (Meatnet goes East project accepted!)

BACK TO TOP

Figure 4: ECCEAMST's Meatnet Index

Initially, Meatnet intended to merely provide access to specific (scientific) databases with the aim to retrieve references to relevant articles. This access was restricted to (paying) ECCEAMST members. During a trial period a limited number of partners were designated 'test-users' who should make an assessment of the usefulness of various candidate data-bases. As time progressed and several databases (e.g. Medline) could be accessed free of charge, only the Agricola and CAB databanks were retained. In addition, the full text of all ECCEAMST publications were also included for ECCEAMST members. The larger part of the Meatnet Web site was made freely accessible (public domain). Information on upcoming events or projects relevant to the meat sector, an inventory on training material, publications, employment possibilities etc. could be retrieved. The intention of the exercise was to have Meatnet serve as a framework for including all relevant information or specific training modules.

From the experience gained over the years it can be seen that in most countries the introduction of Internet, especially in the meat industry sector, is a slow process. Most meat-related companies in Europe have limited access to the Internet in that only their computers in the administrative departments are on-line. Only gradually industry management is committing itself to wider Internet use. It is ECCEAMST's mission to stay ahead of developments and help to lower the thresholds whereever possible.

The European module on 'Veterinary Public Health'

Another project ECCEAMST is involved in is the creation of a European training module on Veterinary Public Health. Most of the partners who initiated this project have experience with Meatnet and they represent veterinary faculties from across Europe (Utrecht, Berlin, Dublin, Perugia, León, Vienna). At their initial meetings, style, format and contents of the module were decided upon. Gradually a large body of case-studies was created with the intention of ultimately making these accessible through Internet. For many partners the concept of case studies and a problem-solving approach was rather new. As the project progresses and the partnership becomes more familiar with the concept, enthusiasm grows.

All case-studies have a particular format, and in addition to a student guide containing the case description and assignments, an explicit teacher's guide has been elaborated for each case. The latter contains information on pedagogic objectives, the required background knowledge necessary to solve the case as well as elaborated answers, which enable teachers across Europe to use the case in their training sessions. Currently, the various cases are tried at the partnership's universities. Relying on Internet will facilitate regular revision without the need to distribute hard copies of updated versions to interested parties (current practice in the trial phase). It is intended to make the student part readily accessible in the future but, in contrast, to provide a pass-word for making the teachers' guides exclusively accessible to educators.

Conclusion

As regards the introduction of Internet for the specific purpose of training the meat sector, there is still considerable work to be done. However, in the very near future Internet will have found its way to all shifts of society, the meat sector being no exception. As ICT develops and our experience grows, so will the acceptance of virtual communication. Not as a replacement of all traditional approaches that have proven effective over centuries, but as a valuable educational tool not to be underestimated.

Acknowledgements

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Smulders, F.J.M. (1995). Towards more effective meat training in Europe: the ECCEAMST approach. In: Proc. 48th Annual Reciprocal Meat Conference, San Antonio (Texas), USA, p 110-115

Internet address 'A': http://cards.tamu.edu/ansc/courses/index.stm

Internet address 'B': http://www.meatnet.nl/links.htm

Internet address 'C': http://courses.ncsu.edu/classes/vmm844001/levine/index.htlm

Internet address 'D': http://63.249.152.62/courses/catalog/lcdrcat.htlm

Internet address 'E': http://www.sik.se/sik/eng/demo/eng_info.htlm

Internet address 'F': http://www.dce.ksu.edu/dce/distance/asi340/

Internet address 'G': http://www.ensia.inra.fr~courtois/fidel/MeatSLU/textbook.htm