

Q-PorkChains newsletter fourth edition

The Q-PorkChains Newsletter is published biannually on the public project homepage - www.q-porkchains.org. The objective of the newsletter is to disseminate news and new knowledge in the field of pig and pork production obtained from the Q-PorkChains project to stakeholders at all levels. The newsletter is divided into different sections specifically directed towards different target groups, i.e. Pig production, Industry, Consumer, Teaching & training and Science. Subscribe the notification at the homepage and receive the newsletter in your mailbox.

In this newsletter you can read about

- The environmental profile of the European pork sector and how to model it.
- Motivation for industry partners to be involved in Q-PorkChains.
- Industrial partners wanted for innovation in the pork production chain.
- Europeans vis-à-vis pig production and pork consumption.
- The Open Learning Platform has reached more than 2000 individuals.
- How do you connect knowledge islands in a sea of knowledge gaps?

Q-PorkChains in short

Q-PorkChains includes 50 partners, from 19 different countries including Europe, Brazil, China, South Africa and USA. The total budget is 20.7 million €. The EU grant is 14.5 million €. Q-PorkChains is an integrated project under the EU's sixth framework programme. The full title of the project is "Improving quality of pork and pork products for the consumer: Development of innovative, integrated, and sustainable food production chains of high quality pork products matching consumer demands". Q-PorkChains is composed of six research modules including consumer and market analysis (Module I), on-farm sustainable production systems (Module II), product development (Module III), integration and sustainable management of the produc-

tion chain (Module IV), molecular biology in pork quality control (Module V) and synthesis of existing knowledge on pork quality, safety and welfare (Module VI). Two horizontal modules (A and B) aims at incorporating new knowledge into pilot and demonstration chains and disseminate Q-PorkChains results to stakeholders at all levels.



Upcoming events:

• **March 10:**

Q-PorkChains workshop: Research challenges for the pork meat sector. In Wageningen, Netherland.

Registration: Jacques.Trienekens@wur.nl before March 5th 2009. Read more at www.q-porkchains.org/activities

• **August 21:**

Q-PorkChains workshop: Pork Quality for the Consumers. In Copenhagen, Denmark.

Registration: At www.q-porkchains.org before May 15th.



The environmental profile of the European pork sector and how to model it

By John E. Hermansen and Thu Lan Nguen, University of Aarhus



The European pork sector is a very competitive one in the sense that the consumer demand within EU as well as outside EU very much depends on costs of pork. It is immediately clear that the costs of the final product depends on the sum of costs throughout the food chain - from feed production to pig rearing and meat processing – and the common language throughout the chain is the EURO's when a pig, a carcass, or a piece of meat is transferred to one stage from another.

Environmental impact

However price is not the only parameter that determines the consumer's in-

terest in pork. Besides product quality and animal welfare also the environmental load of the product has gained increased attention. At present in particular the impact of meat production/consumption on the global warming has a considerable interest among consumers and consequently among actors in

the food chain. This is not a coincidence. It is estimated that approximately 25% of the human impact on global warming is related to food consumption, and in a recent work it was found that the meat and dairy consumption alone accounted for 14% of the global warming effects of the total economic activities in EU. In the same way the meat and dairy con-





Pig production

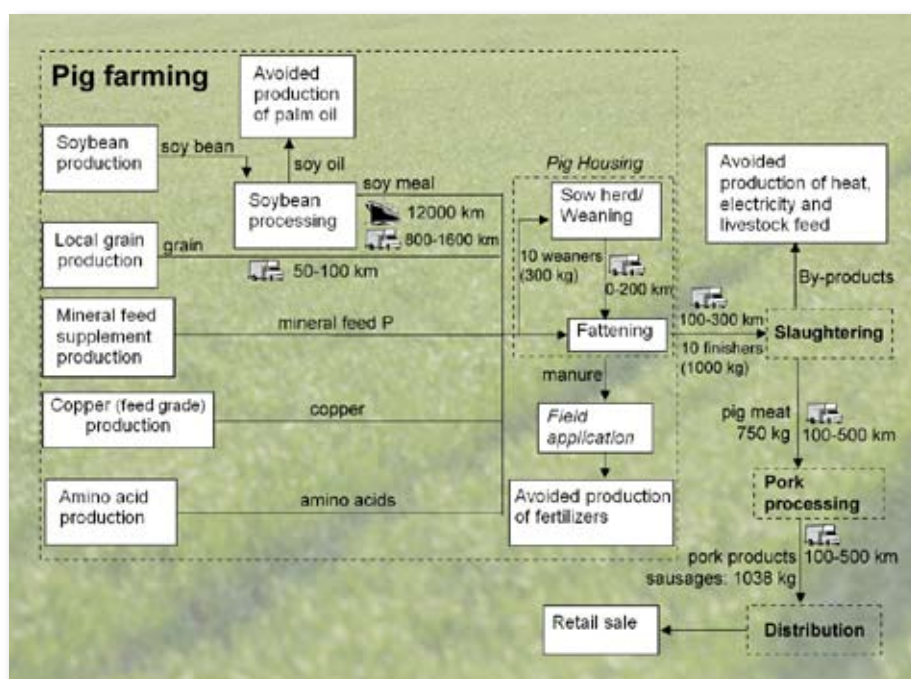


- sumption was responsible for 25% of the total acidification and 47% of the total aquatic eutrophication within EU. Thus meat consumption is a determining factor in the overall environmental impact of our activities, and this highlights the importance of taking these aspects into account in all decisions in the food chain and in the consumption pattern of the consumers.

LCA approach

It is, however, a prerequisite for taking such aspects into consideration that a common language exists among actors in the chain, just like the EURO is regarding financial matters, and that the environmental load can be summed up along the food chain. The framework for such an environmental assessment and communication is the Life Cycle Assessment (LCA) methodology. This is very well developed in purely industrial production, but less developed within food and farming, where a considerable part of the load is related to the farming activities. The LCA approach allows the formation of environmental indicators that integrates emissions of different substances and places in the chain in a logic way, i.e. the contribution to global warming will be a sum of the impacts coming from emissions of CO₂ (related to i.e. burning of fossil fuels used for transport) plus emissions of methane (originating from manure management) and emission of laughing gas (coming from i.e. fertilizer use).

In Q-PorkChains we develop this methodology in evaluating the environmental profile of different pork products originating from different pork



chains and we investigate how this information can be integrated in the decision-making processes along with other decisions regarding quality and financial management.

At present we have performed a preliminary assessment of the environmental profile of the European pork sector including an identification of which part of the pork chain, the highest load of different environmental impacts occurs under different circumstances. In this preliminary work we used production of sausages as a very simplified example and thus considered the processes involved from feed production, farming, slaughtering, processing and distribution, as detailed in the figure above.

The preliminary results show that the total contribution from the production of 1 kg pork product was for global warming 5.3-5.7 kg CO₂ equivalents, for eutrophication 268-338 g NO₃

equivalents and for fossil energy use 29.8-30.8 MJ. Benchmark values for global warming are for many vegetables less than 0.3 kg CO₂ per kg product, which illustrates the importance within the pork sector to address this question.

While acidification and eutrophication is mostly related to the pig farming, pork processing makes its largest contributions to fossil energy use and Global Warming Potential. In contrast, the slaughtering process itself has negligible effects on all impact categories. The coming work will include an assessment of how the environmental load can be reduced - based on cross country information on environmental impact of pig farms as well as routes and organization of the pork chain in the steps after the pig farm. At present data collection takes place for several pig production systems within a number of countries.



Motivation for industry partners to be involved in Q-PorkChains

By Birger Pedersen



Q-PorkChains has integrated its chain oriented piloting and demonstration activities in the horizontal module A. Nine pilot chains and four demonstration chains act as real-world laboratories and integrate research with "on the ground" validation. In addition module A will ensure an efficient experience exchange between participating small, medium and large companies.

Four pilot chains has already been outlined. Starting in 2008 aiming at implementing and validating first research results on

1. Inter-organisational quality management in regional pork chains (main business partner: Erzeugergemeinschaft Osnabrück in Germany)
2. Information management in pork chains (Group Glon in France)
3. Logistics optimization at the interface between slaughter and meat processing (Vion in the Netherlands and Germany)
4. The routine use of newly developed rapid methods for animal health, animal welfare and food safety (Pig-champ Pro in Spain).



Q-PorkChains aims at setting up additional pilot and demonstration activities. A competitive call has just been launched at

www.q-porkchains-industry.org/call.html and is open from March until May 2009 for new industry partners to assist on testing the most promising innovations deriving from the project. Companies are invited to propose their ideas and objectives for additio-

nal pilot or demonstration activities.

At EuroTier 2008 in Hannover, Germany, the Technical Quality Director in Division Fresh Meat from VION FOODS, Jeroen Reijers presented VION FOODS reasons for being involved in Q-PorkChains. ▶



- ▶ The Vion Food group has three main reasons for participating in Q-PorkChains:

- First of all Q-PorkChains provides a good network platform for research activities in the different projects. Secondly EU funding facilitates support within commercial organizations for long-term research activities and finally, the pilot modules give us opportunities to link scientific research activities with a long term focus with practical application in practice, explains Jeroen Reijers.

VION participates in the following Q-PorkChains modules: Module I - consumer and market analysis, module III - product development, module IV - integration and sustainable management of the production chain and finally in the module A - pilot project.

- The motivation for participation in module III is to gather knowledge by means of participation in scientific projects like Q-PorkChains in cooperation with University of Helsinki, University of Copenhagen, IRTA, DMRI and others, tells Jeroen Reijers.

The objective for VION in this module is an overall reduction of salt (NaCl) and nitrite in meat products, and replacement of NaCl and nitrite by other additives with comparable effects on food safety and shelf life, taste, colour etc. The relevant product categories in this connection are bacon, gammon, kassler, cooked hams, sausages and other processed meat.

- Our motivation for participation in module A - is to translate scientific knowledge into a practical measuring method and device and focus on potential effects on chain management in cooperation with Wageningen Universi-



ty and GIQS. The objective for VION is sorting for Water-Holding-Capacity by near infra red light (NIR) as a logistical concept. The core activities for us are development of reliable NIR data collection systems on laboratory scale. Furthermore we search for implementation of practical application in the cutting room and finally we hope for development of a logistic model as a decision support tool, Jeroen Reijers says.

First of all Q-PorkChains provides a good network platform for research activities in the different projects, says Jeroen Reijers from VION Foods.

More about the motivation of companies already involved in Q-PorkChains pilot and demonstration chains can be found at

www.q-porkchains-industry.org



Industrial partners wanted for innovation in the pork production chain

– 975.000 Euro out of EU funding available

By Maren Bruus, GIQS



The project Q-PorkChains stands for quality of pork and pork products for consumers. For pilot and demonstration activities new industrial partners will be integrated via a competitive call during the first half of 2009 for implementation of promising innovative concepts. Companies are invited to propose their ideas and objectives for new pilot or demonstration activities (March till May 2009).

Topics of the call:

- Sustainability aspects in pig production (innovative pig production system based on integrated sustainability criteria or sustainable breeding strategies).
- Development of biological markers for meat quality.
- Development of non invasive on line evaluation of the total and intramuscular fat content in green hams and loins.
- Regional pork chain concepts for local food in European niche markets.
- Implementation of cold chain management systems to improve quality and safety of pork products.
- Validation of life cycle assessment tools.
- Implementation of drying technologies for salt reduced dry-cured meat products to improve quality and health.
- Implementation of certification systems to guarantee the conformity with quality standards / labelled products.
- Benchmarking and demonstration of a centralised data register model for animal health management data.

You are welcome to contact our Q-PorkChains liaison office: www.q-porkchains-industry.org/office.html

The full call text is available at
<http://www.q-porkchains-industry.org/call.html>



Europeans vis-à-vis pig production and pork consumption

Findings from the Module I pan-European consumer survey

By Wim Verbeke, University of Gent



The quantitative survey related to European citizens' attitudes towards pig production systems

and pork consumption behaviour was undertaken in module 1. Data obtained from 1931 households in four European countries (Belgium, Denmark, Poland and Germany) were used. The overall objective of the study was to map peoples' attitude towards pig meat production systems, and to investigate whether these attitudes associate with pork and pork product consumption. Therefore, a two-fold segmentation study was performed.

The first segmentation task was based on people's attitudes towards pig farming and its characteristics, thus from the perspective of the citizen role played by respondents. This task showed that people assign most importance to animal and environmental well-being, rather than the resulting end product characteristics, as criteria to discriminate between "good" and "bad" pig farming practices. Moreover, three small-sized,



clear-cut clusters of citizens were identified, which pay attention to specific pig farming attributes (environmentally conscious, animal welfare conscious, and citizens who support "green" small-scale pig farming), in addition to one cluster that covers the bulk of ambivalent average citizens. It thus becomes clear that attitudes towards environment and nature, animal welfare and the need for an environment-friendly food production are related to specific citizens' attitudes towards pig farming.

The second segmentation task was based on people's reported pork con-

sumption behaviour, thus from the perspective of the consumer role. Frequencies of pork consumption were relatively high within the overall sample. One cluster ("high variety/high frequency") clearly stands out in terms of pork consumption frequency. This segment consists of consumers who seem to accept all kinds of pork products, and herewith represent a potentially lucrative target market for novel pork products. Owing to their interest in novelty and innovation, these consumers are likely to be the early adopters of new pork products. Among the second "high variety/medium frequency" cluster, ▶



Consumer



► which is the wealthier one, consumers are also open to variety, but have only a moderate frequency in pork consumption. Thus, they might be slower in adopting new products. Finally, consumers in the third “low frequency/low variety” cluster present a “hedonist” nature, together with a relatively “green” background attitude. These consumers are quite selective with respect to the pork products they eat, and choose pork only with a relatively low frequency.

Together, both segmentation tasks provide a detailed investigation of European citizen attitudes towards pig production and their pork consumption behaviour. Despite the fact that various clusters include citizens who put different emphasis to certain pig

farming characteristics, pig production system preferences do not significantly influence their observed pork consumption behaviour. Differences among the clusters in terms of regular pork consumption are small. Moreover, the “ambivalent, average” consumers are by far the most regular pork consumer type across all pork products. Overall, the relationship between citizenship and consumption behaviour is weak: what people think about pig production in their role as citizens does not significantly influence their pork consumption choices.



The Open Learning Platform has reached more than 2000 individuals

By Anne Algers, SLU



Continuously the open learning platform is developing for higher education, on-

the-job training and capacity building, and with learning resources that also support face-to-face teaching. The Q-PorkChains Open Learning Platform includes initially a total of 23 e-learning resources, with eight of these now available in other languages than English. The wiki is initially including more than 50 definitions and the platform has now reached more than 2000 individuals.

You are encouraged to visit www.porktraining.org and to use it in your teaching!

The learning resources will be quality checked, posted and marked so that they can easily be found in the repository. The resources can be selected and utilized either directly by the learner or by teachers using the resources in their teaching and training. Learners can reuse and in some situations adapt and modify the learning resources (e.g. by adding new cases). In this way the repository will include an increasing number of learning resources.

Q-PORK CHAINS Open Learning Platform
this portal is a customized version of the [Open Training Platform \(OTP\)](#)

MODULES CATEGORIES LINKS GLOSSARY WIKI COMMUNITY

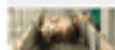
Home > Categories > Agriculture

Agriculture has 12 learning resource(s) including

- [Young Train Food Quality and Safety](#) **UPDATED**
Format: online
Languages: English
Producer: Young Train
[More details](#) [Bookmark It](#)
- [Animal Ethics Dilemma - An Interactive Learning University and Professional Training](#) **UPDATED**
Format: online
Languages: English, Danish, Swedish, Dutch, Sp
Producer: Alison Hanlon, Trine Dich, Tina Hans
Loor, Peter Sandee, Anne Algers
[More details](#) [Bookmark It](#)
- [Driving Pigs to Stunning](#) **UPDATED**
Format: online
Languages: English, Danish
Producer: Q-Pork Chains
[More details](#) [Bookmark It](#)
- [InraPorc: a resource for analyzing performance nutritional strategies](#) **UPDATED**
Format: online
Languages: English, French, German, Spanish, I
Producer: INRA
[More details](#) [Bookmark It](#)
- [Security Guide for Pork Producers](#) **UPDATED**
Format: online
Languages: English, Spanish
Producer: National Pork Board
[More details](#) [Bookmark It](#)
- [Virtual Food Science Field Trips](#) **UPDATED**
Format: online

The category of Agriculture has 12 learning resources. Driving pigs to stunning is an example of free on-line e-learning. Pictures and video illustrate the preslaughter handling process, and enables users to critically evaluate how driving systems can influence pig welfare and pork quality. The e-learning is completed by a self-test and evaluation.

Visit and explore - bookmark it:
<http://www.porktraining.org>





How do you connect knowledge islands in a sea of knowledge gaps?

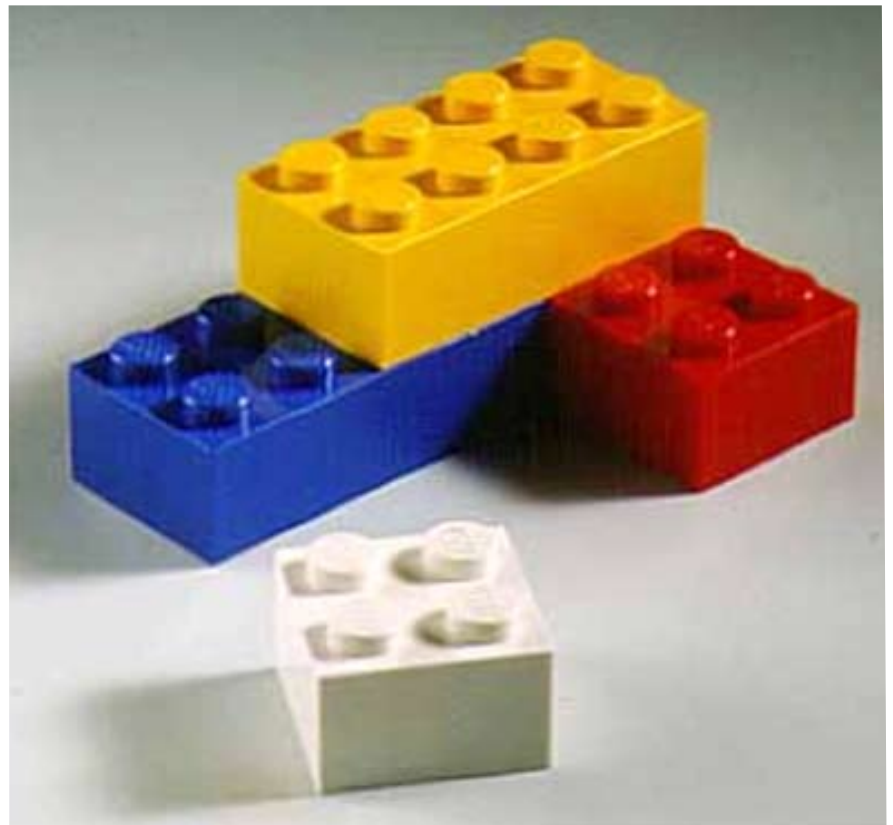
By Jesper B-Hansen, DMRI and Andrea Wilson, SAC



If you want to describe the influence of animal welfare on the juiciness of pork chops, or the effect of low prevalence of Salmonella in the pig stable on the prevalence of Salmonella in the end product, you will

have a very busy time searching in many sources, but if the knowledge were collected in fast searchable formats, the job would be much easier. In module VI we will use 2009 to make it easier to find and to connect knowledge in the form of mathematical models. It may sound complicated, but the heading could be "Tools for more effective science", and therefore this part of the project targets scientists working with animal welfare, food safety or meat quality. Here we will present three tools:

1. Meta Analysis as a tool for combining results from different experiments.
2. A database for collection of knowledge.
3. Search, map, enter models and combine your own models on the Internet.



Combining results from different experiments using Meta-Analysis

The scientific literature usually contains multiple scientific experiments that have been conducted to answer specific questions, such as for example the effect of dietary supplementation on pork tenderness. However, experiments usually differ in their setup (e.g. they may use different pig breeds or different number

of pigs), and thus also in their results. A tool is needed to combine the information into a single statistically sound model that provides a conclusive answer to our question that is valid over a wide range of conditions. The statistical tool we apply for answering questions concerned with meat quality is called meta-analysis, which produces meta-models describing the relationship between vari-



The road from raw data or scientific papers via statistical models to a Meta Model:

- ▶ ous influencing factors on pork quality. Pig welfare and product safety questions cause different modelling approaches.

Database open for collection of your knowledge

A lot of new knowledge on pork quality, safety and animal welfare is collected in the Q-PorkChains project. In module VI we work on the synthesis of existing knowledge on pork quality, safety and animal welfare. We have created an Open Source database, where project partners can store almost any kind of information. One part of the database is for storing data before they are used in statistical models, a second part of the database is for storing statistical models, and a third part is for storing models from meta-analysis, which is statistical analysis carried out on a collection of other statistical models. It is possible to

trace all models back to the source which can be either scientific papers or measurements.

Mapping the models

There is still need for a tool to answer more complicated questions such as “the influence of animal welfare on the juiciness of pork chops”, because the answer relies on a combination of several models produced in this module using different approaches.

At the moment, the user can search for models on specific attributes, i.e.

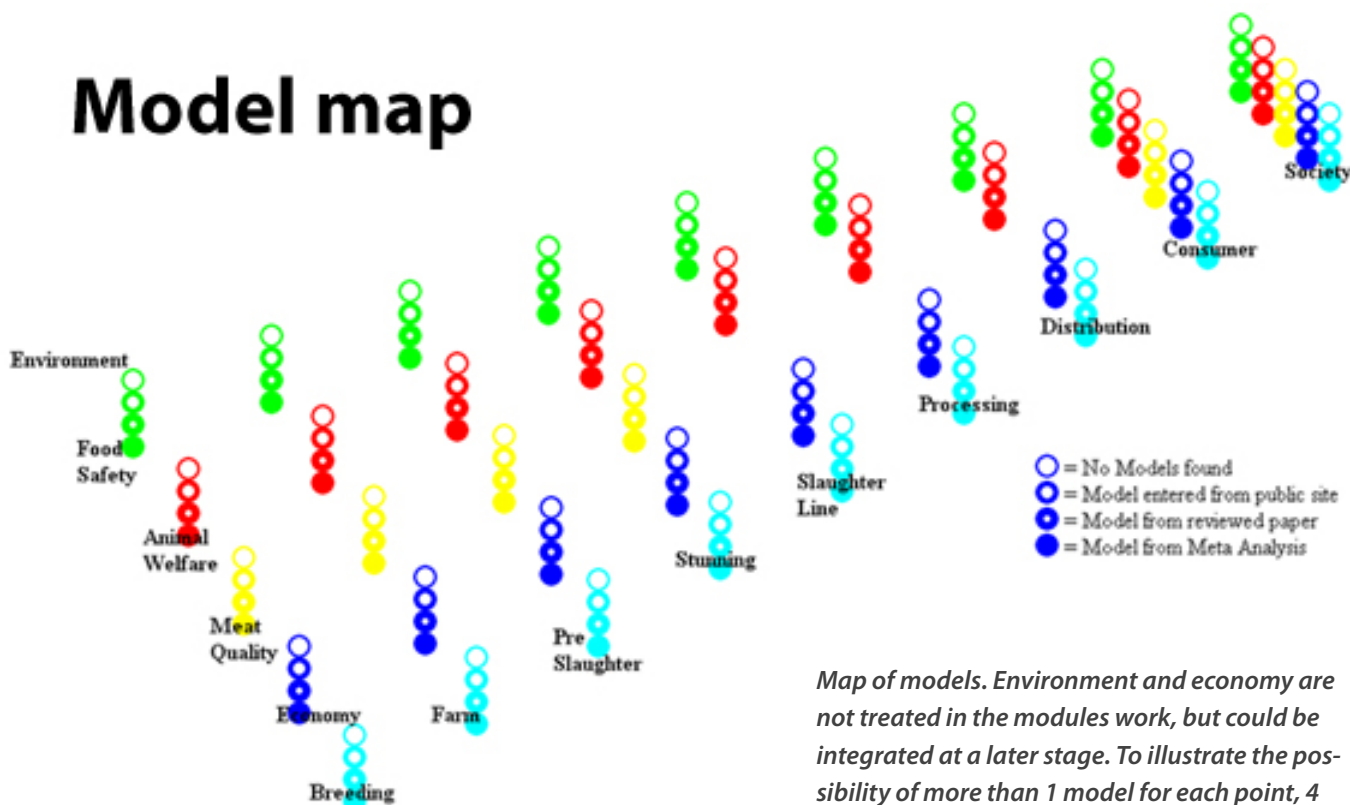
tenderness or drip loss. The more information stored in the database, the more valuable it will be as a tool for finding and connecting models.

During 2009 work focus on how to make the knowledge more searchable by mapping, easy connectible, and easy to integrate in statistical tools. Previously work in EU projects within the social sciences has focused on creating a common way of communicating statistical information. ▶





Model map



Map of models. Environment and economy are not treated in the modules work, but could be integrated at a later stage. To illustrate the possibility of more than 1 model for each point, 4 circles are shown at each point.

- ▶ A first draft of the database and the tool for mapping of models is already on the Internet - www.qpc6.dk

Open for input from the public

Like a Wikipedia the public shall be able to enter models to test ideas on effects and interactions. This could be a usefull tool when you are planning new experiments. The models entered from the public site can be de-selected, when you search for scientificly proven models.

Combining the models

During 2009 we also aim at developing a tool, whereby the user can se-

lect models created in this module as you would select Lego bricks, and then the tool should give a proposal for possible combinations of the models. The user will be able to do some limited editing of the combined model, before it is parsed to statistical packages.

We hope that in the end, the meta-analysis, the database and the map-

ping tools will make meat science more effective, to benefit both scientists and the community.

Jesper Blom-Hansen will be available for suggestions, comments and questions at jb@danishmeat.dk.

- 1 University of Copenhagen (KU)
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- 3 Wageningen University (WU)
- 4 University of Bonn (UB)
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- 6 Agricultural University of Athens (AUA)
- 7 University Gent (UGent)
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- 14 Institute of Genetics and Animal Breeding, Polish Academy of Science (PAS)
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- 18 Inst. for Food and Agricultural Research and Technology (IRTA)
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- 21 Norwegian Food Research Institute (Matforsk)
- 22 ASG Veehouderij BV (ASGV)
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- 30 Association of Meat Processors in Bulgaria (AMB)
- 31 Institut de la Filière Porcine (IFIP)
- 32 Chambre Régionale d'Agriculture de Bretagne (CRAB)
- 33 The Danish Meat Trade College (DMTC)
- 34 Danish Crown (DC)
- 35 Vion Food Group (VFG)
- 36 Nutreco, Swine Research Centre (SRC)
- 37 Pigchamp Pro (PP)
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