Newsletter

Q-PORK CHAINS

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Q-PorkChains
newsletter third edition

The Q-PorkChains Newsletter is published biannually on the public project homepage - **www. q-porkchains.org**. By subscription you can receive the newsletter via email. 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.

In this newsletter you can read about

Pork carpaccio from black Mallorca pigs

By Jacint Arnau

Module III in Q-PorkChains focuses on the development of innovative technologies for improved pork products matching consumer demands and is currently investigating if the meat safety and quality of carpaccio can be improved by combining high pressure treatment, fermentation and drying of pork.

Traditionally, carpaccio has been considered a dish of thinly sliced raw beef, veal, tuna etc served as an appetizer with a dressing containing olive oil, Parmesan cheese and seasonings. The home-made carpaccio is prepared from tender cuts which are slightly frozen and cut with a very sharp knife or meat slicer to obtain thin slices. The meat industry is currently preparing more convenient ready-to-eat carpaccio by curing pieces of meat, that are then frozen, sliced, ▶

- packaged under vacuum or modified atmosphere without oxygen and commercialized at refrigeration temperature. As a result of this process, a stable red colour is obtained and the growth of microorganisms is reduced. However, the consumption of this product is limited probably due to safety concerns and fresh meat appearance.
  In order to improve meat safety and quality of cured carpaccio, high-pressure treatments at subzero temperature, fermentation and slight drying of pork are processes that are currently being evaluated within Q-PorkChains. This procedure is expected to allow for the production of a safer and more flavoured pork product that will offer the consumers a wider variety of carpaccio which is currently based only on fresh beef.

  Preliminary results show that tenderloins from black Mallorca pigs are better suited to the production of high quality slightly dried pork carpaccio than those from intensively reared pigs.

  This article is based on studies done by Jacint Arnau, Dolors Guardia and Carolina Realini.

Project rationale

Q-PorkChains is an integrated project under the EU´s sixth framework programme and focuses on quality of pork and pork products by covering the total production chain from farm-to-fork. Fiftyone partners from 19 different countries will during a period of five years (2007-2011) collaborate towards the ultimate goal which is to develop and implement new innovative methods to improve and control the quality of pork. The partners includes some of the most important research institutions and industries working in the field of pig and pork production in Europe, Brazil, China, South Africa and USA.

The challenge for the pig and pork industry is to increase the production of high quality pork products, by investing and/or sale. In any case, the consumers must be aware, that the price of the products will increase due to higher production costs of pigs produced in sustainable production systems with optimized meat quality. Several aspects, such as i.e. economics, consumer demands, and environmental sustainability are crucial on the way to develop new methods to improve and control the quality of pork.

The consumer needs are becoming more and more sophisticated and the consumers no longer only consume food to cover their basic needs. The consumers willingness to spend more money on products with added value such as i.e. convenience, higher eating quality, animal welfare and healthiness are increasing. In the industry, the production are often hold to needs of the short term market and are at odds with the consumer preferences on the long run. Q-PorkChains will address some of the misconceptions between the consumers and the industry which is likely to appear along the farm-to-fork chain.

Facts about Q-PorkChains

Q-PorkChains includes 51 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 nine modules. The six research modules include consumer and market analysis (Module I), on-farm sustainable production systems (Module II), product development (Module III), integration and sustainable management of the production 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.

New biology as a tool for control of pork quality

By Lars Kristensen

The need for improving animal welfare and meat quality characteristics are addressed in module V. The overall aim of the module is to provide the industry with molecular markers developed from several of the new so-called 'omics' methods that have emerged during the last decade. It is expected that these new molecular markers can be used for the production of high added value meat and meat products, at all stages in the chain from farm to fork.

Development of markers for meat quality has been of interest for researchers and the industry for many years. A good marker enables e.g. screening of a population of animals for that particular marker and afterwards select animals suited for breeding. Two examples of that are the halothane gene and the RN- gene that can be used as markers for stress susceptibility and high glycogen levels, respectively.

A prerequisite of discovering new markers is that quality characteristics in the meat is reflected by the biological status of the animal, i.e. the genome and the proteome of the muscles, fat tissue or blood is related to the quality of meat and fat. At the end of the project we might have markers for meat quality characteristics such as ultimate pH or eating quality.

Module V consists of three work packages (WP) where WP1 focuses on developing and identifying molecular markers of meat and fat quality. WP2 aims at testing these markers in a wide variety of commercial and experimental pork production chains in all the participating countries.. In WP3 the researchers will work on the link between selected markers and their molecular mechanisms.

Three Danish partners (Danish Crown, University of Aarhus and Danish Meat Research Institute) are collaborating on obtaining data from a typical Danish commercial pork production

Pig production

chain. In September 2008 the experiment will be enrolled. Two different pig producers will deliver pigs. The pigs will be slaughtered in a commercial slaughter house to ensure valid experimental conditions. Samples for testing the new biomarkers as well as meat quality measurements will be obtained at three locations on the slaughterline. Finally, the eating quality will be evaluated using sensory profiling. After these experiments, correlations to the new biological markers will begin.

What is Omics?

The complete sequencing of the genome has started a new research area called 'omics'. In stead of studying one protein or one gene at a time it is now possible to study whole organelles or biological pathways simultaneously. The term 'omics' refers to the comprehensive analysis of biological systems. A variety of 'omics' subdisciplines have emerged, each with their own set of instruments and techniques. The 'omics' technology that has driven these new areas of research consist of DNA and protein microarrays, mass spectrometry and a number of other techniques that enables high-throughput analysis. New 'omics' technology is developing constantly, however, among the more well-known are 'Gen-omics' and Prote-omics' that are focusing on the genome and the proteome, respectively.
Reference: www.omicsworld.com

Pilot activity:

A network information system to support preventive animal health and to improve pork chain management

By Maren Bruns

This pilot chain is mainly focusing on the organisational optimisation of B2B (business to business) activities to improve pork chain management. The challenge is to implement a centralised information system in the holding Group Glon for improving the exchange and use of quality, animal health and business relevant information in the pork production chain. The network information called Sanibase.

Sanibase is an inter-enterprise / chain information system, which has been set up to support health management in the pork chain. The starting point behind Sanibase was to improve synergies between different operators in the pork chain regarding preventive animal health. Sanibase integrates all data relevant for analysing a particular health situation on a farm and makes them available for different users. By sharing information, transparency if desirable and also confidentiality if necessary, can be assured. The system can be used for other purposes with respect to different aspects of pork chain management.

Business partners:

The main business partner Group Glon (**www.glon-sanders.com**)

Software developer Chainfood (**www.chainfood.com**)

Research partner:

University of Bonn - FoodNetCenter (**www.foodnetcenter.uni-bonn.de**)

Wageningen University (www.wageningenuniversiteit.nl)

Coordination:

GIQS - Trans Border Integrated Quality Assurance (**www.giqs.org**)

Group Glon has been awarded with the Innov'Space 2008 prize

By Maren Bruns

Legal requirements and follow-up in the pork chain require instant knowledge of all information regarding animal health status on a farm. The relevant data is often disseminated in different sorts of files throughout the office. A secured access to all this relevant information is made possible by Sanibase. Sanibase is a network information system which centralises information relating to actual on-farm health status. Any member of an authorised user community has access to this data.

Sanibase gathers in one place lab information, cooperatives information, technical information (weight gain, feed consumption), prescriptions of health vet communities and visit protocols. Slaughter data can also be integrated. Authorised users instantly share the same information. That means that veterinarians have an immediate and regular insight into on-farm health status. Advisory services of technicians can be improved and farmers have an instant view and history of their profile on a unique web secured information portal.

Sanibase ensures a totally secured and confidential updating of the data (only authorised members have access) which is made on a regular basis (time lack ranges from every day to twice a week). Files are recorded by automatic procedures.

In the future, and on demand, Sanibase can be extended.

This framework has been developed by SANDERS and the partner cooperatives (L'ARMORIQUE and PORC OUEST). Further more, one pilot chain of Q-PorkChains deals with the R&D of the information system Sanibase.

Anaïs Jouvente from Group Glon: The network information system SANIBASE centralises information relating to actual on-farm health status.

Iron deficiency rescued by the "meat factor"?

By Anne Dorthe Sørensen

Iron deficiency is one of the most prevalent worldwide public health problems. In European countries, the prevalence of iron deficiency is 10 to 40 % among women of childbearing age, and 6 to 40 % among teenage girls and the prevalence is much higher in developing countries. The consequences are serious for both children and adults. In infants and children it may affect the mental development and learning abilities and may also affect behavioural and physical development. In adults it will lead to diminished work capacity, impaired concentration ability, higher susceptibility to infections and deceases including longer recovery time due to reduced capability of the immune function.

While iron supplementation is generally considered an effective curative strategy for combating iron deficiency, several adverse effects are associated with the very low iron bioavailability of these iron supplements. Specifically, the high levels of iron contained within these supplements, meant to offset their low iron bioavailability, result in relatively large amounts of unabsorbed iron present in the intestinal lumen where iron may participate in redox reactions and formation of radicals with the possibility of performing oxidative damage.

Utilisation of the unique properties of meat components to enhance non-haem iron bioavailability, commonly designated the "meat factor", could provide an approach to decrease the amount of iron used in supplementation or increase non-haem iron bioavailability in pork-based food products that may reduce the prevalence of iron deficiency in dietary prevention strategies.

Consumer

Interest in the "meat factor" is not a new issue. Research within this area has been done since 1950 and maybe even before. This demonstrates that the "meat factor" story is a complex and complicated issue that puzzles the researchers. Three major issues are often debated. The first issue is the uncertainty concerning the origin of the "meat factor", which generates a long list of unanswered questions. Is it a protein, carbohydrate or lipid? Is it one component or a combination of components that are responsible for the special effects in meats? Is it general for all types/varieties of meats? The second major issue is how to quantify and confirm the existence of "meat factor" activity. The third major issue is that the "meat factor" effect tends to disappear when using certain methods to separate meat components in the attempt to isolate fractions with "meat factor" activity.

In Q-PorkChains WP III.1.c the overall aim is to characterise the "meat factor" with focus on the three major issues raised here. In this study, it is assumed that the "meat factor" originates from protein – as the muscle protein is digested to peptides in the gastro intestinal tract it performs its action e.g. enhancing iron bioavailability. The effects of test samples on iron bioavailability are predicted by models mimicking digestion which correlates qualitatively with studies on iron absorption in humans. Finally, methods suitable to separate meat components and preserving the "meat factor" effect has been established. Now the meat factor enhanced effect remains to be confirmed in a human single meal intervention study.

Q-PorkChains Open Learning Platform

By Anne Algers

The Q-PorkChains Open Learning Platform (OLP) includes :

- An archive for learning resources,
- A wikipedia
- A community for the discussion of teaching and training issues.

The Q-PorkChains-OLP will be launched in October 2008 and has the potential during the project period to become a useful tool for teachers and trainers. The platform has been built in collaboration with UNESCO for the sustainability of the project.

You can submit new resources, share, find, use and reuse existing resources and evaluate existing resources by submitting your own rates and reviews of resources.

You can use the Q-PorkChains-wiki in your teaching and training. It is an encyclopedic reference for the pig and pork sector. It attempts to collect and summarize all relevant knowledge in the field and will hopefully be a growing list of articles written collaboratively by volunteers (teachers, trainers and learners) around the world, and all of its articles can be edited by anyone with access to the Wiki website.

Finally you can use the virtual community for discussions on best practice of teaching and training. It is hosting an ongoing conversation about the idea of sharing of learning resources in the area of the pig and pork chains. The community is meant to inspire new forms of practice, elicit comment, and provide a basis for new knowledge.

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-PorkChains at ICoMST 2008 - science and industry meet

By Carsten Gyldahl-Jensen

Multiple access to Q-PorkChains and a high level of dissemination is a major challenge for a large integrated project such as Q-PorkChains. ICoMST is one way to address Q-PorkChains scientifically. In August 2008, Q-PorkChains was promoted at the International Congress of Meat Science and Technology in South Africa.

Like in any industrial sector the meat science and the meat industry exchange knowledge. The industry turns knowledge into products and know-how, based on synthesized knowledge delivered by scientists, that explain the reasons why it works. Science benefits due to co-operation as the industry helps to point out the important issues on the market.

Q-PorkChains is an example of, how focus in the scientific field and the industry differ, but through the network efforts can converge. Q-PorkChains as well as ICoMST are places for science and industry to meet, to innovate and network. Three partners in Q-PorkChains, a professor from Finland, and from the Netherlands, a PhD student and a business consultant was interviewed at ICoMST. They have different reasons for participating in Q-PorkChains, but agree that Q-PorkChains in a scientific perspective represent a platform for networking and exploitation.

Q-PorkChains - an ideal way of science

- Q-PorkChains is a good concept, because scientists usually focus on one aspect and study that in detail over time. And sometimes forgets the interactions with other important aspects within the scientific field. Q-PorkChains deals with a wide variety of aspects within pig and pork production. Off course, Q-PorkChains can not solve all problems, but whatever result is obtained - at small or large scale - it will connect to the whole system, Professor Eero Puolanne says. He continues:

- Usually when somebody has a research problem, they do not tell ▶

Prof. Eero Puolanne: Q-PorkChains gives me a platform – from the theoretical considerations to the practical applications – within Module III currently. Eero Puolanne is also ICoMST Contact Secretary.

Science

anyone. They keep it as a secret, as long as it hasn't been published. Participating in a large project as Q-PorkChains might change this and within this community the problems will be more or less openly discussed. Naturally all researchers have their priorities, but questions and discussions should be open. This is the ideal way of performing science.

This is one of the reasons why, Q-PorkChains has a weblog on the Industry Platform. At the moment Innovation is open for discussion at www.q-porkchains-industry.org. The weblog is one way to address open innovation among participants.

Public science needs to get closer to the application. This will help the businesses to develop, but it is a two-way street. The business consultant Don Clyde from CCL Nutricontrol says:

- Private companies are very focussed on production and quality control. Unfortunately private companies do not have easy access to scientific knowledge from national institutions, and they do not encourage each other to redevelop. Sometimes a private company has a research unit which enables a high level of exploitation. Our company wants to get a better connection between science and applications. This project has a good balance between the science and application of the science content. Q-PorkChains can be a good example of, how science and industry can benefit from each other.

A science project within Module A

By Christiaan Kapper

My PhD study is aiming at water-holding capacity in meat, especially in the area between fundamental science and the practical application. The goal is to develop a model that can predict water-holding capacity under practical circumstances.

The first part of the study is to investigate the commonly used parameters to measure water-holding capacity on commercial slaughtered animals over a longer period of time. This is done. Then I will directly measure the parameters on the slaughterline and also use NIRS (Infrared spectroscopy). In the end I will hopefully predict the water-holding capacity by modelling. It is supposed to be a system which might be able to measure proteins on the slaughterline rapidly and accurately.
At the moment my study is not a stand-alone-study, because it is integrated into Q-PorkChains. Other modules can benefit from my work, and my study can benefit from work done within other modules.

Science

- PORK CHAINS

Connection point of knowledge and inventions

As the researchers invent new methods or synthesize knowledge, Q-PorkChains can be an important contact point due to the large network and extended network via the Industry platform.

- My research certainly benefits from being part of Q-PorkChains, because I get a broader network through the participation. For example my network has enlarged by attending a project meeting in Girona with approximately 100 participants. This interaction would have been difficult without Q-PorkChains. I have already met a lot of people in my scientific area and have been able to network with them. By attending the right forums and meeting different experts, I am now in a good position to having established a network for my study. Off course, ICoMST is important for my work as well, the Dutch PhD student Christiaan Kapper says.

Affiliate via the industry platform

Within Q-PorkChains especially one module is focusing on implementation of research results and collaborates with SME´s on this aspect. The industry platform is more or less an extension of the project. It is not enough that studies have been made, they must be implemented. The project has horizontal activities, including implementation and dissemination. The industry platform is an extension to this especially targeted at small and medium size enterprises.

What is the most important for other companies to know about Q-PorkChains?

- For a start it would be the networking opportunities to broaden their own network and make contacts with experts who would be difficult to approach otherwise. For example a small company making technology for NIRS could join Q-PorkChains to develop specific instruments for measuring meat quality. And via the Industry Platform get involved in a pilot chain and thereby achieve a grant, if they join a group within Q-PorkChains or create their own group of 2-3 members. Affiliation would be a keyword for other industry researchers, that is not aware of the project, is Don Clydes answer to the question.

A science project within Module III

by Professor Eero Poulanne

The main interest in my research group in Helsinki is water-binding capacity. The basic problem is: Why is water actually retained in a meat system. There is currently no generally agreed theoretical explanation for this. In meat, especially in pork, water-binding is an important quality characteristic. At the moment the project is very theoretical, but we want to go more into practical aspects. The practical aspect that has been picked up is salt content, i.e. the need to reduce salt in meat products. There is much international interest in that.
Off course, we can not guarantee that we will solve the problem completely. If we will succeed, and we will determine, why water is hold in meat – then we can start to find practical usage of the results. There is a lot of water-binding knowledge, concerning the effects of pH, addition of salt, etc., but we do not know the theoretical basis of water-binding well enough. Maybe if we will get more knowledge, we will be able to get better tools to reduce sodium.

1	University of Copenhagen (KU)	Denmark
2	University of Aarhus (AU)	Denmark
3	Wageningen University (WU)	Netherlands
4	University of Bonn (UB)	Germany
5	Swedish University of Agricultural Sciences (SLU)	Sweden
6	Agricultural University of Athens (AUA)	Greece
7	University Gent (UGent)	Belgium
8	University of Newcastle (UNEW)	United Kingdom
9	Technical University of Lodz (TUL)	Poland
10	Politechnic University of Madrid (UPM)	Spain
11	LaSalle Beauvais Polytechnic Institute (LB)	France
12	University of Helsinki (UH)	Finland
13	Royal Veterinary College (RVC)	United Kingdom
14	Institute of Genetics and Animal Breeding, Polish Academy of Science (PAS)	Poland
15	National University of Ireland, University College Dublin (UCD)	Ireland
16	University of Naples (UNINA)	Italy
17	French National Institute for Agricultural Research (INRA)	France
18	Inst. for Food and Agricultural Research and Technology (IRTA)	Spain
20	Teagasc, Ashtown Food Research Centre (AFRC)	Ireland
21	Norwegian Food Research Institute (Matforsk)	Norway
22	ASG Veehouderij BV (ASGV)	Netherlands
23	Danish Meat Research Institute (DMRI)	Denmark
24	Central Food Research Institute (CFRI)	Hungary
25	Agrotechnology & Food Sciences group (AFSG)	Netherlands
26	RIKILT - Institute of Food Safety (RIKILT)	Netherlands
27	Grenzüberschreitende Integrierte Qualitätssicherung (GIQS)	Germany
29	Zentralverband der Deutschen Schweineproduction (ZDS)	Germany
30	Association of Meat Processors in Bulgaria (AMB)	Bulgaria
31	Institut de la Filière Porcine (IFIP)	France
32	Chambre Régionale d'Agriculture de Bretagne (CRAB)	France
33	The Danish Meat Trade College (DMTC)	Denmark
34	Danish Crown (DC)	Denmark
35	Vion Food Group (VFG)	Netherlands
36	Nutreco, Swine Research Centre (SRC)	Netherlands
37	Pigchamp Pro (PP)	Spain
38	Pig Improvement Company UK Limited (PIC)	United Kingdom
39	Casademont (CS)	Spain
40	Esteban Espuña (EE)	Spain
41	Glon Group (GG)	France
42	Erzeugergemeinschaft Osnabrueck (EGO)	Germany
43	France Hybrides (FH)	France
44	Chainfood (CHF)	Netherlands
46	Qualitype (QT)	Germany
48	Nanjing Agricultural University (NAU)	China
49	University of Pretoria (UP)	South Africa
50	FUNDACE, University of São Paulo (FD)	Brazil
51	Inst. of Animal Science/ Chinese Academy of Ag. Science (CAAS)	China
52	Kansas State University (KSU)	United States of America
53	Scottish Agricultural College (SAC)	United Kingdom
54	European commission ()	Belgium

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