

Q-PorkChains newsletter fifth 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

- A new book on European pork chains.
- Improving the quality of pork for the consumer.
- Biomarkers can predict pork quality.
- Pilot activity: Use of rapid methods for animal health, animal welfare and food safety.
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- Animal welfare - friendly pig housing systems.
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- Open international QPC-mid-term conference in Bonn.

New book on European pork chains

Prize: €: 62 / US\$ 93

Four scientists, Jacques Trienekens and Nel Wognum from Wageningen University, the Netherlands and Brigitte

Petersen and Detert Brinkmann from University of Bonn, Germany present their results from research in Module IV in a new book:

"European pork chains – Diversity and quality challenges in consumer-oriented production and distribution".

The main focus of the book is on how well diverse and fragmented

supply in the European pork sector matches differentiating demands for pork products in rapidly evolving markets. One of the central topics discussed in the book is management of quality in diverse mainstream and special European pork chains. Inter-enterprise information systems, governance forms, logistics and sustainability aspects of European pork chains are also presented, as well as a number of interesting innovations in the chains.

"European pork chains" consists of four chapters that discuss the European pork chain as a whole and nine chapters that present case studies. The latter comprise three specialised pork chains (Iberian ham from Spain, Mangaliza pork from Hungary, and organic pork from the Netherlands) and three

regional pork chains in Europe (a Greek integrated chain, the German "Eichenhof" chain and the French "Cochon de Bretagne" chain).

The book is intended to be a valuable source of information for practitioners

For table of content see:
www.wageningenacademic.com/porkchains
For purchase:
sales@wageningenacademic.com

Upcoming events:

November 17:

SME Workshop: Pig health management – importance of general and selected specific measures". In Bonn, Germany.
Registration: Before Oct. 15th 2009
www.q-porkchains.org/registration

November 18:

Open conference: Improving quality of pork for the consumer. Bonn, Germany.
Registration: Before Oct. 15th 2009
www.q-porkchains.org/registration



Improving the quality of pork for the consumer

In January 2007, the large integrated EU project Q-PorkChains was initiated. Almost half way through the project period of five year a picture is drawn to illustrate the scientific key activities. This we hope, can give you a general view of the project.

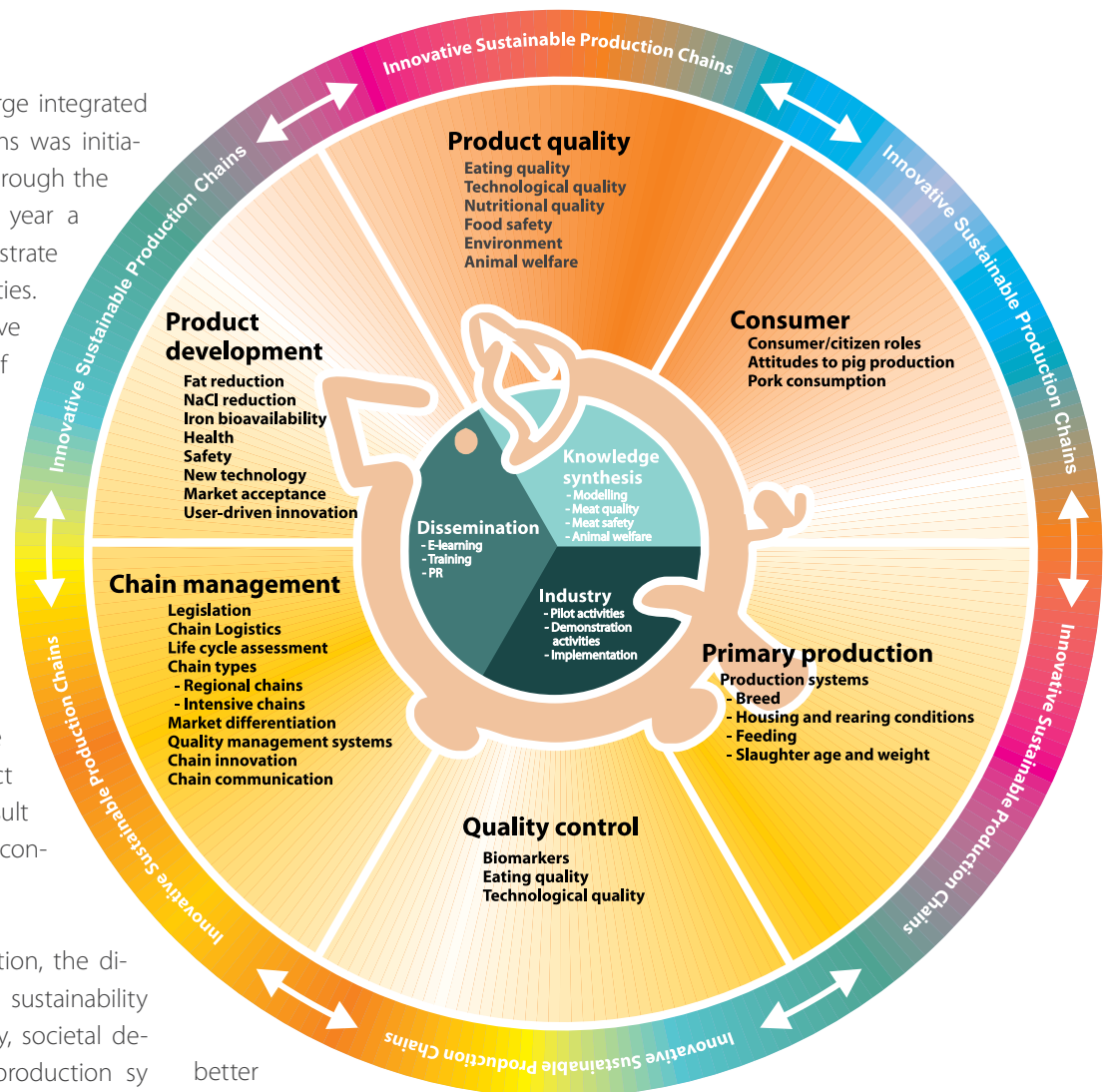
Research on consumer and citizen roles focuses on developing new tools for marketing and development of porkbased products. The ambitious aim is to generate up to 70 new product ideas, which are to result in 15 new product concepts.

Under primary production, the diversity, flexibility and sustainability (environment, economy, societal demand) of farm level production systems are explored. This research will contribute to the maintenance and development of a diversity of sustainable primary production systems that correspond to market demands. Quality control focuses on development and application of new and appropriate molecular control tools in pork production. This will provide a

better foundation for breeding for improved meat quality and for quality rating at slaughterhouses and pricing of pork, and will give the consumers the possibility to choose products based on quality and price.

Chain management focuses on inte-

grated quality management and logistic and sustainable network optimization. Various aspects like chain quality systems, supporting chain information, chain governance systems, chain performance, and innovation are investigated. Distribution networks including environmental as-





- ▶ Aspects and production and processing technology used in various stages of the chains are also investigated.

Product development focuses on innovative technologies for improved pork products, which match consumer demands with regard to quality, safety, nutrition, and convenience. Concerning nutritional enhancement of meat products reduction of sodium in cooked ham and fermented sausages as well as fat reduction in the latter is investigated. For developing convenience pork products the effects of different technological treatments such as freezing at different temperatures, high pressure treatments, dry-curing and ageing are investigated.

Knowledge synthesis aims at synthesising the existing knowledge on pork quality, pork safety and animal welfare into prediction models. All three themes (pork quality, pork safety and pig welfare) aim at making their results available through an interactive webbased model.

The topic "Industry" aims at facilitating cooperation with Small and Medium Enterprises (SMEs) on pilot research and demonstration activities and develop inter-organisational collaboration along pork chains and networks.

Dissemination of Q-PorkChains activities is undertaken via development of E-learning resources, training activities and general PR. An Open Learning Platform (OLP) containing a wiki on pig and pork production, a repository and a virtual community has

contributed to dissemination by reaching new target groups such as teachers on higher education and trainers in industry.



Q-PorkChains in short

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.



Biomarkers can predict pork quality

By Niels Oksbjerg, University of Aarhus



A group of scientists under the leadership of Prof. Niels Oksbjerg from Faculty of Agricultural Sciences, University of Aarhus, presented on the Q-PorkChains Workshop in Copenhagen some of their most important results from their studies so far in module V using new biology as a tool for control of pork quality.



Promising results

The results showed, that large variation in meat quality traits were obtained in both experiments and combined with omics technologies this gave rise to several proteomic peaks and transcripts that can be used as biomarkers to predict meat quality.

At the same time proteomic peaks can be used to study the effect of stress and resting time on meat quality traits. The transcriptomics results are also

very promising for development of biomarkers to predict meat quality and to better understand the genetic background affecting pork quality. Finally, metabonomics indicated that plasma lactate may be a simple marker for water holding capacity.

Description of experiments

The objectives of these studies are to identify markers of different meat

quality traits on the basis of different breeds and rearing conditions as well as stress-induced differences in meat quality. Biological markers related to meat quality traits are investigated at gene, protein, and metabolite levels by the use of omics technologies such as microarray, proteomics, and NMR-based metabonomics, and analyzed using bioinformatics tools.

In experiment 1, ten litters of four ►



Pig production



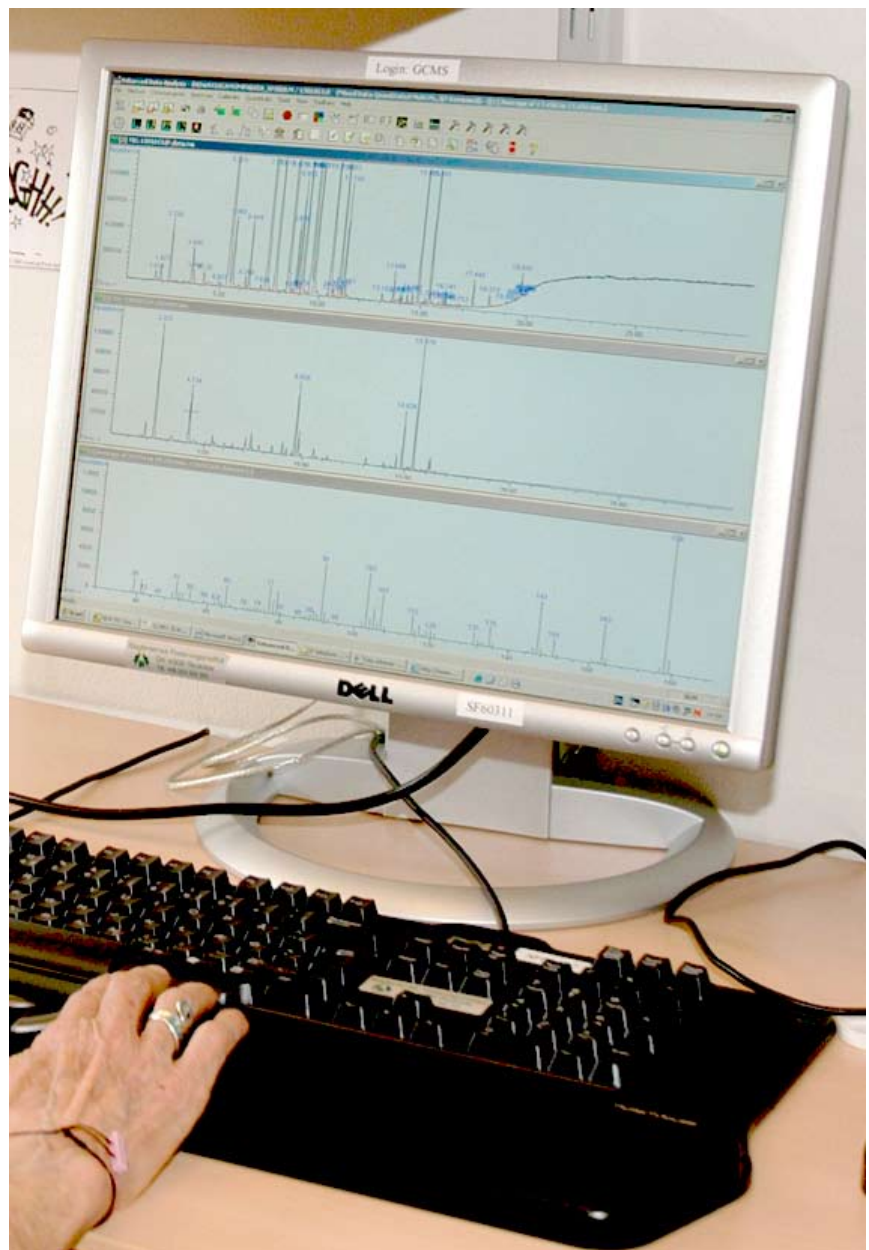
- ▶ female pigs were allocated to four treatment groups according to litter: control without stress exposure or treadmill exercise for approximately 30 min. The exercise was followed by either 0, 1, or 3 hours rest before slaughter. Muscle biopsy samples from M. longissimus dorsi (LD) and M. biceps femoris (BF) and blood samples were taken at the time of sticking and after 24 h samples were analysed for various meat quality traits, proteomics and microarray.

In experiment 2, 50 pigs: 20 Large White (LW) and 30 Basque (B) finishing castrated boars were used in the experiment. From each breed, 10 pigs were reared in a conventional (slatted floor, 1.0 m²/pig) system, and 10 pigs

in an alternative (bedding and outdoor area, 2.4 m²/pig) system. Moreover, 10 Basque pigs were reared in the extensive (free range) production system of the Basque region (south west of France). All animals were slaughtered at the average live weight of 150 kg. M. longissimus dorsi (LD) samples were

taken 30 minutes after exsanguination, frozen immediately in liquid nitrogen and stored at -80° C until RNA isolation.

Read the full article at www.q-porkchains.org/publications





Pilot activity: Use of rapid methods for animal health, animal welfare and food safety.

By Thorsten Klauke,
Co-authors Maren Bruns,
Matilde Piñeiro
and Detert Brinkmann



Animal health and food safety issues are becoming increasingly important to all sectors of livestock production. The improvement in the health and welfare of pigs are important factors that will determine the sustainability of the European pig production in the next years. Therefore results of general and selected measures are important indicators for the pig health status.

One of the Q-PorkChains pilot chains attends to focus on general pig health measures. Scientific and business actors are collaborating on the development of a rapid test on Acute Phase Proteins (APPs) for animal health, animal welfare and food safety. A demonstrable and sustainable improvement in pig health is achieved as a contributing segment to the recovery of the pig industry and a sustainable rural economy.

The team in this pilot chain is concentrating on three subtasks:

- Development of an APP rapid test at lab level.
- Implementation of the rapid test into pork production at farm level.
- Analysis of relationships between APP levels and meat quality traits based on studies of the universities of Bonn and Aarhus.

APPs are plasma proteins that modify their concentration following infection, inflammation, trauma or stress.

The circulating concentrations of these proteins can provide an objective unit of measurement of the health status of an animal and are increasingly being used as markers for animal health and welfare in farm animals such as pigs or cattle. APP assay can identify herds where poor hygiene, lack of surveillance, poor vaccination responses or other factors have lead to immunological stress and a reduction of feed conversion. Measuring APP concentration will be valuable to assess the health status of new groups of animals entering to the farm, as well as for final inspection ▶

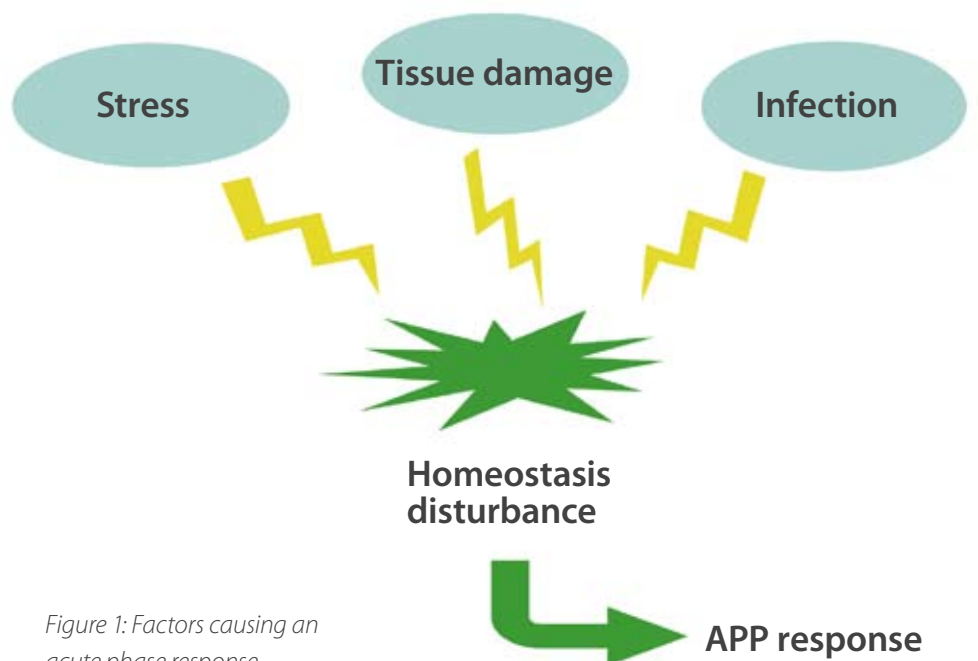


Figure 1: Factors causing an acute phase response



- ▶ of slaughter pigs, improving surveillance programs.

The rapid test is tested in this pilot chain at lab level. After that the implementation is started. The developed rapid test shall be implemented for on-farm use at living pigs to identify their health status. Aim of this approach is the incorporation of routinely APP monitoring in integrated quality systems that allows a sequential health analysis of pig stocks.

Further more, studies focussing on the correlation between APP levels and meat quality traits is still under performance. One study intends to analyse an influence of APP level on meat quality traits in general (1). A second study includes the effect of stress on meat quality and APP reaction (2). Important performance criteria at farm and slaughter level are measured. Both Pig-MAP and haptoglobin (Hp) are analysed in blood plasma obtained from pig carcasses during slaughter in the studies (1 and 2).

The main benefits for the industry are:

- Within the scope of quality management the improvement in pig health and resulting welfare status can be measured.
- Farmers and pig industry will be enabled to identify and breed healthier and more productive pigs. Since risks can be quantified easier and disease surveillance information available to pig producers can be enhanced.
- The communication between the actors in the production chain can be improved.
- The health of pigs will benefit consumers through better quality meat and meat products. Food safety is increased.

Interim results will be presented and discussed during the **workshop on “Pig health management - importance of general and selected specific measures” targeted for industrial actors on the 17th of November.**

This workshop is taking place in the scope of the International Meat Week – Business meets Science, in Bonn, Germany.

Please visit www.q-porkchains.org for more information and registration.



The team of this pilot chain (out of eight pilot chains) consists of the following partners:

- PigCHAMP Pro, Matilde Pineiro
- University of Bonn, Detert Brinkmann and Thorsten Klauke
- GIQS e.V., Maren Bruns



Pork consumption in Brazil: Consumers, citizens and the market

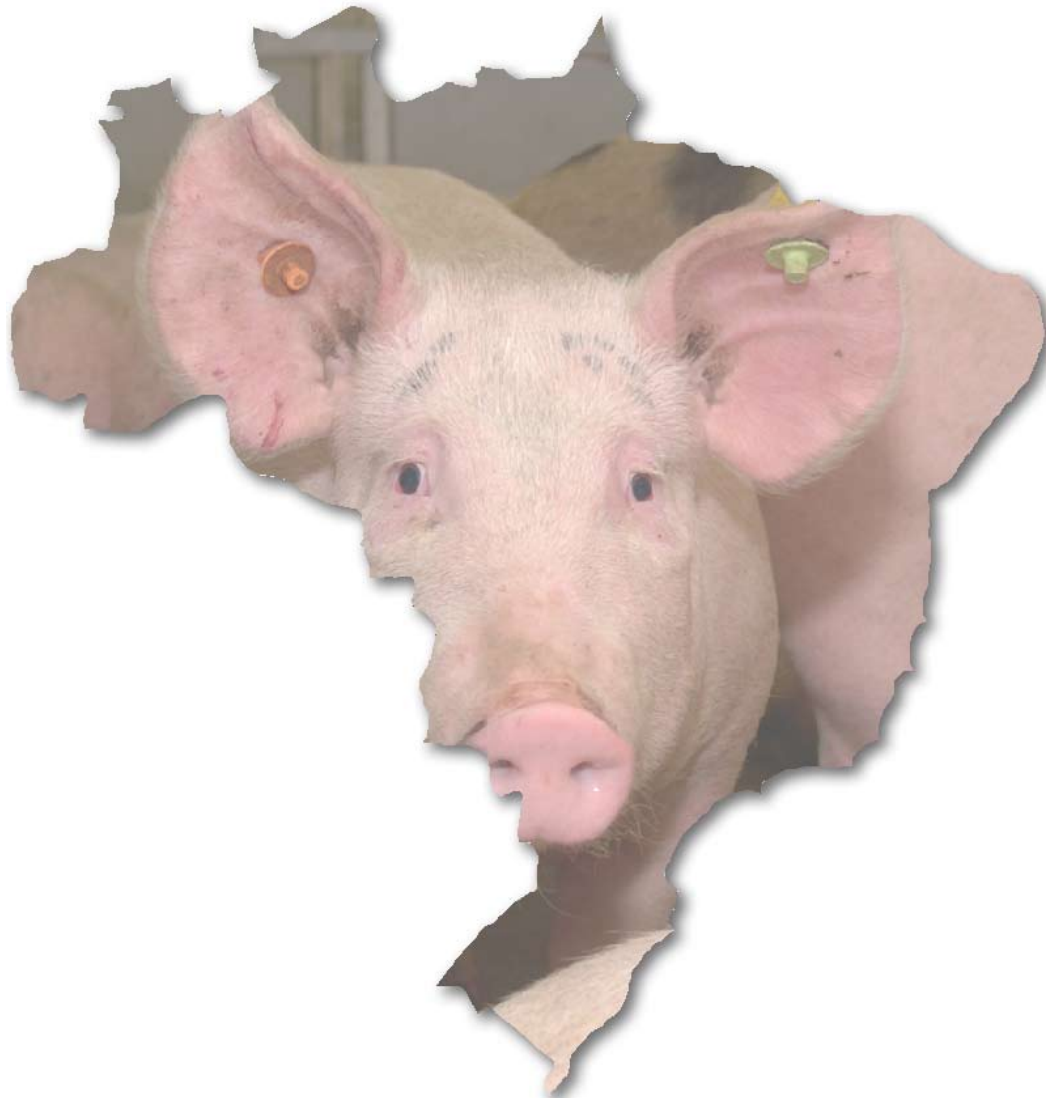
By Marcia Dutra de Barcellos



Brazil is a country of continental dimensions (850

millions of hectares) formed by people descending from a large variety of cultures. Population is estimated in 189.3 million inhabitants. Like the European, Brazilian consumers are a heterogeneous group, where significant variability in food consumption behaviour is expected.

Regional differences are strongly marked in the Brazilian food context. People from the northeast part of the country have very different eating habits than people from the southern states. In the XIX century, the southern region had the first strong colonization wave of immigrants from Europe and many of the eating habits from that region were established based on those influences. Hence, pork consumption is higher in the south and southeast if compared to the north, northeast and central west regions.



In spite of being the world's most consumed meat (16.5 kg/inhab/year, according to FAO/ABIPECS, 2006), pork meat consumption ranks only third place in Brazil. Reported annual

pork consumption in 2008 was only 13.5 kg/inhab/year (ABIPECS, 2008), very low if compared to the country's poultry and beef (36 and 37 kg/inhab/year respectively) consumption. ►



► Nevertheless, pork consumption in Brazil has been increasing in the last years. From 1990 to 2006 the average annual growth was 4.9% (USDA-2007). Interestingly, about 65% of the Brazilian pork consumption is based on meat products, like sausages, salami and ham. The main reasons why fresh cuts are not preferred can be explained by cultural and historical aspects related to the somehow negative image consumers' have from the pork production system and misbeliefs about pork meat consumption.

Domestic consumption represents around 87% of the overall Brazilian pork production. The excess 13% are exported, mainly to Russia and Asian countries (ABIPECS, 2008). Brazil can be seen as an important market for pork meat products. In 2008, 2.5 million tons were internally consumed and the country ranked 6th in world pork consumption. Brazil is also an important player in terms of global pork production being the 4th biggest producer and 4th biggest exporter (ABIPECS, 2008). In that sense, to understand the Brazilian pork meat market becomes fundamental from a global food marketing perspective.

Results from the Q-PorkChains survey conducted in 2008 with 482 consumers confirmed that consumption of pork meat and pork products is still very low in Brazil, although showing a high penetration of selected pork meat products (salami, ham, mortadela and sausages). The biggest problems seem to be more a conjunc-

tion of external factors rather than consumers' acceptance of the products. Those factors include the poor availability of the products at the point of sale, the low variety of cuts, the high price of the products (or the low income of the population), the big size of the pieces for sales, the lack of convenience of the products and the old image of the fatty pig animal type, contributing to the belief of an unhealthy food.

Pork products in Brazil are mostly consumed at home, with family, at any day (either weekend or weekends), indicating good opportunities for the development of innovative pork products. Brazilians are overall satisfied with the pork products listed on the questionnaire performed in module I. In terms of product positioning and the development of new products, the industry should take into account the concerns about the perceived aspects of production, cultural habits of consumption and the overall availability of the products (low variety, big cuts and no convenience).

Recently, a study aiming to map Brazilian citizen attitudes towards pig meat production systems and to investigate whether these attitudes associate with pork and pork product consumption was conducted. Three clusters were identified as "average", "environmental conscious" and "tradition and animal welfare-oriented" citizens. Although attitudes towards environment and nature were indeed

related to citizens' specific attitudes towards pig farming at the cluster level, the relationship between citizenship and consumption behaviour was found to be weak, as it was suggested for Europe.

Nevertheless, pig producers should be aware of the dangers that follow from a large part of the population having weak or unrealistic ideas about pig production. Weak attitudes are easily changed and therefore quite susceptible to impacts from the media when a particular problem related to pig production should occur. In the long run it is in the interest of pig producers that consumers develop clearer ideas of how pig production occurs in a modern society, and that they develop a positive understanding of the related processes.



Animal welfare – friendly Pig Housing Systems

A Learning Resource for teachers and trainers



By Anne Algers, SLU

It is not an easy task to develop learning resources, which are in great demand from the stakeholders within pig and pork production and at the same time the result of ongoing scientific research in the Q-PorkChains project.

During the past six months we have been developing the learning resource “Animal Welfare-friendly Pig Housing Systems” and taking into consideration the small gap between demand and ongoing research within this learning resource. The first learning resource partly contains results from Module I: “Citizens are increasingly reacting on animal welfare and environmental protection problems in pig production at the farm level, but this does not necessarily mean that such sustainability issues affect their choice in the shop” and partly information from Module II:

“An inventory of 84 pork production systems identified in 23 European countries”.

The learning resource consist of a



number of videos which demonstrate the natural behavior of pigs and how intensive production systems can affect the behavior of the animals. It is evident that alternative production systems in many cases are related to inferior production results in comparison with conventional systems; however some animal welfare-friendly systems result in high production figures.

It is rewarding that teachers not participating in the Q-PorkChains from Brazil, Canada and Uganda have informed us that they make use of the

learning resource in their teaching. Moreover a Portuguese version will soon be uploaded in benefit for Portuguese and Brazilian students.

The overall aim of the teaching and training activities in Q-PorkChains is to disseminate research through teaching, training and learning. Hopefully these learning resources will be relevant and integrated in teaching and training activities world-wide. Furthermore, it is desired that learning resources for the pig and pork sector developed outside the project will be shared within this learning platform.



A successful EU seminar in Copenhagen

By Birger Pedersen



Approximately 180 scientists from all over the world – many of which had participated in the previous

55th International Congress of Meat Science and Technology in Copenhagen, appeared, when the doors were opened to the EU workshop on Q-PorkChains a sunny Friday the 21st of August at the University of Copenhagen, Faculty of Life Sciences .

Project coordinator, Prof. Anders H. Karlsson, welcomed all participants after which 12 scientists from different research modules gave a 15-20 minutes presentation.



The presentations were as follows:

1. Prof. Klaus Grunert: Consumer/Market analysis
2. Prof. Wim Verbeke: To eat or not to eat pork, how frequently and how varied?
3. Prof. George Chrysoschoidis: New product in the pork sector: Creativity and scientific input
4. Prof. Michel Bonneau: Diversity, flexibility & sustainability of farm-level production systems
5. Prof. Jacint Arnau: Product development – quality, nutrition and convenience
6. Dr. Anne Dorthe Sørensen: Meat improves the absorption of non-heme iron – characterization of this “meat factor”
7. Prof. Euro Paolanne: The effects of low pH in pork
8. Prof. Niels Oksbjerg: New biology as a tool for control of pork quality
9. Dr. Jette Faveil Young: Stress and meat quality
10. Dr. Marinus te Pas: Protein markers of meat quality
11. Joanna Wyszynska: Searching gene markers for meat quality
12. Mr. Jesper Blom: Synthesis of existing knowledge on pork quality, safety and welfare

“Altogether a very successful workshop with a lot of new information from Q-PorkChains,” Prof. Anders H. Karlsson, concluded in his closing remarks.

All presentations is available at www.q-porkchains.org



Open international QPC-mid-term conference in Bonn

By Birger Pedersen



The conference entitled "Improving the quality of pork for the consumer" is open to the public and addresses issues especially of interest to stakeholders within pig industry.

The conference will take place on Wednesday the 18th of November 2009 and will be held at the Gustav-Stresemann European Institute for Conferences and Professional Training in Bonn (GSI).

There will be internal and external Q-PorkChains speakers from research and industry covering topics along the production chain and the programme is:



Opening and welcome speech

- Anders H. Karlsson (Coordinator of Q-PorkChains, University of Copenhagen)
- Karl Schellander (Dean of the Agricultural Faculty, University of Bonn)
- Manfred Nüssel (President of DRV – German Raiffeisen Association)
- Daniele Tissot Boireau (EU-Commission, DG Research)

Chain to consumer

- Herman Schlöder (Head of Meat and Livestock Department, German Federal Ministry BMELV)
- Klaus Grunert (Director of MAPP, University of Aarhus)
- Helfried Giesen (CEO, Westfleisch eG)
- Michael Lendle (CEO, AFC Risk&Crisis Consult)

Pork quality and novel convenient products

- Susanne Støier (Research Director, Danish Meat Research Institute)
- Wilhelm Jaeger (Director Agriculture, TönniesFleisch)
- Jacint Arnau (Senior Researcher, IRTA)
- B.A.P. (Bert) Urlings (Director Quality Assurance, VION Food Group)

New breeding technology and sustainable farming

- Marinus te Pas (Senior Researcher, ASG WageningenUniversity)
- Gary Evans (Technology Business Manager, PIC/Genus plc.)
- Michel Bonneau (Research Coordinator, INRA)
- Stefanie Bröring (FH Osnabrück, University of Applied Sciences/Bröring Unternehmensgruppe)
- Andrea Gavinelli (Head of Unit Welfare, Directorate D – Animal Health and Welfare, EU Commission)

Panel discussion: From an EU integrated project to a sustainable industry-academia network

SME Training Workshop

A training workshop named "Pig health management – importance of general and selected specific measures" will take place on

the 17th of November in Bonn.

This training event is targeted to stakeholders from the industry, preferably small and medium-sized enterprises (SMEs) of different stages of the pork production chain and to veterinarians.

The detailed programme can be downloaded: www.q-porkchains.org

Registration

Please register for the conference and SME training workshop at www.q-porkchains.org

Deadline: 15.10.2009

- 1 University of Copenhagen (KU)
- 2 University of Aarhus (AU)
- 3 Wageningen University (WU)
- 4 University of Bonn (UB)
- 5 Swedish University of Agricultural Sciences (SLU)
- 6 Agricultural University of Athens (AUA)
- 7 University Gent (UGent)
- 8 University of Newcastle (UNEW)
- 9 Technical University of Lodz (TUL)
- 10 Politechnic University of Madrid (UPM)
- 11 LaSalle Beauvais Polytechnic Institute (LB)
- 12 University of Helsinki (UH)
- 13 Royal Veterinary College (RVC)
- 14 Institute of Genetics and Animal Breeding, Polish Academy of Science (PAS)
- 15 National University of Ireland, University College Dublin (UCD)
- 16 University of Naples (UNINA)
- 17 French National Institute for Agricultural Research (INRA)
- 18 Inst. for Food and Agricultural Research and Technology (IRTA)
- 20 Teagasc, Ashtown Food Research Centre (AFRC)
- 21 Norwegian Food Research Institute (Matforsk)
- 22 ASG Veehouderij BV (ASGV)
- 23 Danish Meat Research Institute (DMRI)
- 24 Central Food Research Institute (CFRI)
- 25 Agrotechnology & Food Sciences group (AFSG)
- 26 RIKILT - Institute of Food Safety (RIKILT)
- 27 Grenzüberschreitende Integrierte Qualitätssicherung (GIQS)
- 29 Zentralverband der Deutschen Schweineproduktion (ZDS)
- 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)
- 38 Pig Improvement Company UK Limited (PIC)
- 39 Casademont (CS)
- 40 Esteban Espuña (EE)
- 41 Glon Group (GG)
- 42 Erzeugergemeinschaft Osnabrueck (EGO)
- 43 France Hybrides (FH)
- 44 Chainfood (CHF)
- 46 Qualitype (QT)
- 48 Nanjing Agricultural University (NAU)
- 49 University of Pretoria (UP)
- 50 FUNDACE, University of São Paulo (FD)
- 51 Inst. of Animal Science/ Chinese Academy of Ag. Science (CAAS)
- 52 Kansas State University (KSU)
- 53 Scottish Agricultural College (SAC)
- 54 European commission ()

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