atf animal task force

A European Public-Private Platform

4th Animal Task Force Seminar

Putting the İ in livestock

innovating for a productive and sustainable livestock sector

Seminar report

5 November 2014, Brussels

The Animal Task Force's 4th Seminar 'Putting the i in livestock- innovating for a competitive and sustainable livestock sector' brought to light new challenges to innovate for a sustainable livestock sector. The Seminar focused on key challenges for innovation and ways to turn the excellent research being done in Europe into practice. Inspiring examples from innovative businesses were central at the Seminar. Representatives from Ynsect, UNIFORM-Agri, Elanco and Vencomatic Group presented examples of enabling technologies for societal change from their companies. Together with key-note speakers from the research arena and policy-makers, the discussion focussed on how we can further enhance innovation that supports a sustainable development of a competitive animal sector in Europe. This is a report of the Seminar.

Welcome and introduction

Martin Scholten (President Animal Task Force) welcomes all participants at the 4th Animal Task Force Seminar. The Animal Task Force (ATF) has been working since 2011 to promote the research and innovation needs for a sustainable and competitive animal production in Europe. Societal challenges in the animal domain are the starting point for defining knowledge development and research needs that should lead to innovations to overcome these challenges.

ATF has identified three key societal challenges that we feel need to be addressed: Resource efficiency, Responsible livestock farming systems, and Healthy livestock and people. ATF develops and promotes priority topics for knowledge development in these three key areas.

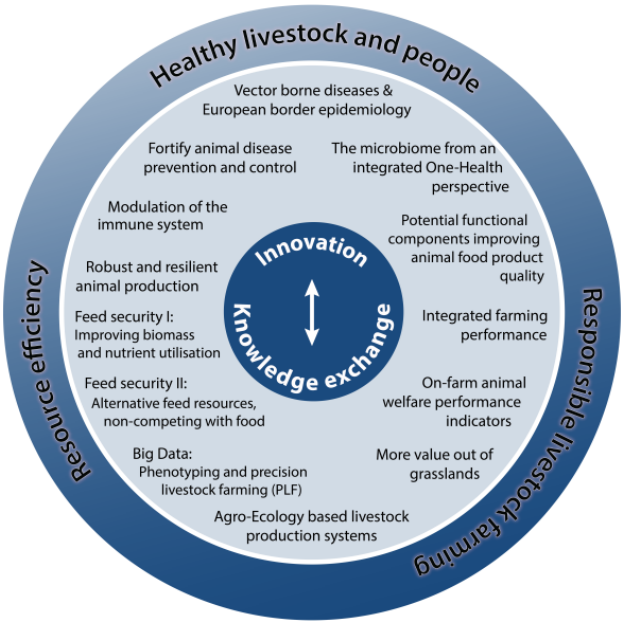
Putting the 'i' in livestock

In 2012 ATF organised its first Seminar on Resource Efficiency. In 2013, two seminars have been organised: on Healthy livestock and people (together with EADGENE), and one on Responsible livestock farming systems. The 4th Animal Task Force Seminar focuses on the next step: innovation. Innovations that will enable a more sustainable and competitive animal sector, and the processes needed to bring the excellent research done in Europe into practice. In other words: How can be put the 'i' in livestock?

Key questions to be addressed during the Seminar are:
What is the key challenge in innovation for the European animal production sector?
How can we turn the excellent research being done in Europe into practice?
How can industry and research together work on a more sustainable sector?

Addendum to White Paper

In 2013, ATF launched a White Paper with research and innovation priorities for the animal sector. On Friday November 7, ATF launches an Addendum to the White Paper. This Addendum presents 14 priority topics for research and innovation to overcome important societal challenges, that we feel need support under the work programme 2016/2017 of Horizon2020. The figure below shows the 14 priority topics presented in the Addendum. The full Addendum can be found here.



Innovating animal production for a food secure world

Sebastien Treyer (IDDRI) started off the Seminar with discussing the SCAR Foresight study on sustainable food consumption in a resource-constrained world. Several numbers showed the importance of animal products for food and nutrition security. Animal feed is a key element for world food supply.

If we want to face food security, we should therefore integrate animal and vegetal systems in agriculture innovation. The challenge is to realise food, nutrition and feed security within the boundaries of the planet. Therefore we need to design innovation processes that maximise on more than one performance indicator: productivity (per animal, per hectare, or per worker), energy, input, biomass, emissions, waste welfare and resilience.

'Animal production systems form an important element in world food supply. Animal feed is key element for food security. If we want to face food security sustainably we should not think differently about animal and vegetal systems in agriculture.'

Reshaping innovation pathways to meet this challenge can be done from a productivity narrative and a sufficiency narrative. The first narrative takes increasing productivity as a starting point, the latter starts with consumption patterns. Diversity should be a central issue in innovation pathways: Innovation needs to further improve sustainability of intensive production systems, and also hardly needs to improve the sustainability of extensive systems.

Please find the presentation of Sebastien Treyer here

Innovation: what is it and how does it work?

Philippe Baret (University of Louvain) is expert in agricultural innovation pathways. In his key-note speech, he discussed new challenges in innovation and potential ways to address them. He stresses that innovation is more than an invention, idea or a new technology. Innovation also comprises the uptake of the invention, idea or technology by society or organisations. Innovation is both a process and an outcome.

In traditional innovation process follows the path of research -> development -> use. The context of agricultural systems has however changed over the years. Agricultural systems involve a diversity of actors (consumer, society, producers, industry, politics), certain levels of uncertainties, a biological dimension and a temporal dimension. The innovation paradigm in agricultural systems has shifted from classic economy to systems thinking; from focus on the plot to focus on the whole food system.

'For successful innovation, we need more than only technological development. Also orgware, software and sysware are needed.'

The innovation needed to address the food security and sustainability challenges mentioned by Sebastien Treyer requires system innovation. Next to new technologies, also innovation in skills and competencies, and in regulations are needed. It requires innovation in 'hardware'(new technological developments, such as new antibiotics), 'software' (new skills and competencies such as local food markets), 'orgware' (new regulations and institutions) and 'sysware' (systems thinking, e.g. closing the nitrogen loop).

Baret gives some guidelines for starting with systems thinking for agricultural innovation:

- Identification: Acknowledge the system, Identify actors and norms; Point to lock-ins.
- Consider options: More than one innovation fits the system; All innovations are not possible.
- Implementation: From adoption to transdisciplinarity; Out of the box thinking - wicked innovations.

Please find the presentation of Philippe Baret here

Innovating sustainable animal production and the European research arena

Several research and innovation initiatives are active in Europe. Two research and innovation programmes are highlighted during the Seminar.

Bernhard Polten (Standing Committee on Agricultural Research – Sustainable Animal Production CWG) introduces the SCAR Collaborative Working Group (CWG) on Sustainable Animal Production (SAP), which was initiated by a common effort of Spain and Germany in the beginning of 2013. SCAR Collaborative Working Groups are set up in different key research areas to stimulate and increase research collaboration between funders and programme managers in multiple Member

States. The CWG SAP has been officially established in December 2013, and is supported by 15 European Member States and one Associated State[1]. The Animal Task Force is an observer in the CWG SAP.
The CWG SAP has established among the Member States an integrated approach and a holistic view on a sustainable animal production sector, which is economically viable, socially acceptable and with minimal impact on the environment. The Scope includes Environment; Animal breeding; Livestock production systems: conception, evaluation, assessment; Animal nutrition; Collaboration and knowledge exchange; Economics, with contribution from ANIHWA ERA-Net, CWG-AHW Welfare Subgroup and FACCE-JPI.

The final report aims to provide recommendations for research in SAP for future ERA-Net, including an overview on animal production worldwide and in the EU by report of Member States on livestock production, and an overview of research in animal production. The report will provide information of the Member States on the research status, priorities and gaps in animal research, which will be included in the proposal for establishing an ERA-net under Horizon 2020 call ISIB-12e-2015 "Sustainable Livestock Production". Deadline for submission is 11th June 2015. Babette Breuer will be in charge of the work packages. Ideas for the proposals are welcomed.

Please find the presentation of Bernhard Polten here

Iman Boot (European Commission, Directorate-General for Agriculture and Rural Development) gives an update on the European Innovation Partnership on Agricultural Productivity and Sustainability (EIP-Agri). The EIP-Agri is set up to support the process from research to innovation in farming practice. To close this gap more interaction is needed, especially interaction between farming and research, but also between farming practices. The EIP-Agri supports this interaction by going beyond speeding up the transfer of knowledge. The focus is on bottom-up approaches, on partnerships between various stakeholders, on shaping existing knowledge into solutions and on co-ownership to put solutions into practice quickly.

'EIP-Agri is about closing the innovation gap – from research to farming in practice.'

Instruments to implements initiatives under the EIP-Agri are:
The **Rural Development Programme** will provide project funding for Operational Groups. Funding will only be provided for new initiatives, not for initiatives already running.
The **European Union Research Programme Horizon 2020** will support thematic networks and research projects involving on-farm experiments. Multi-actor projects form an important component of new calls.
The **EIP-network** is the heart of the EIP-Agri. The new website www.eip-agri.eu connects all actors, knowledge and projects involved in the EIP.

Please find the presentation of Iman Boot here

Enabling technologies for societal change - breaking innovations in the animal sector.

Industry is a key player in the innovation process, to discover novel products through internal R&D programmes and to bring these products to the market. Four companies tell about their breaking innovation in the animal sector.

Benjamin Armenjon (Ynsect) on insects as novel feed. Population growth and increased demand for food leads to challenges for feedstock industries, as was also addressed by Sebastien Treyer. Insects are possible sources of feed as they have a good digestibility, composition and use and offer many other benefits. Insect protein and oil derivatives offer a wide range of nutrients of interest
for feed, food & fuel industries. Currently, Ynsect is looking at opportunities to replace part of fishmeal (used as feed in aquaculture) with insects. Challenges to overcome are regulation and technologies to create economies of scale. Know-how from other sectors (biotechnology and zootechnics) is used to address the technical obstacles for insect mass production.

Please find the presentation of Benjamin Armenjon here

Harm-Jan van der Beek (UNIFORM-Agri) gives an example of precision livestock farming. UNIFROM- Agri supplies 10.000 farmers worldwide with dairy software. Over the years, several innovations have made the dairy sector more sustainable from societal, environmental and economic point of view. Examples are the Milking Robot, GPS for fieldwork, Genomics and use of sensors. Cow level sensors give a lot of information on the direct state of the animal: milk flow / second, activity (heat, lay/stand-up time), rumination, conductivity during milking, diseases (lameness).

[1] AT, BE, DE, DK, ES, FI, FR, IE, IT, LT, LU, NL, PL, SE,TR, UK

This allows for major improvement in animal management. UNIFORM-Agri works on innovation in cooperation with among others the University of Ghent and Dairy Campus of Wageningen UR.

Critical success factors for innovations at user-level are the knowledge to use and apply the innovation in daily practice. Sound training of farmers is an important aspect for success. Also the return on investment by the farmer in relation to changing regulation is a critical factor of the success of an innovation. Regulation need to be consistent for a longer period as investments are a longer period.

'Success factor for innovation in precision livestock farming: Regulation need to be consistent, as investments in innovation are for a longer period'

From an industry perspective, the protection of investments forms a critical success factor. IP rights is complicated in cooperation and puts a brake on open innovation. Good regulations for all players can overcome this. In addition, societal acceptability of innovations can be a constraint. As an example, there is public resistance to larger farms, but these larger farms are often necessary to make a profitable business and create a return on investments for sustainable production. Improving public awareness of reality of food production can overcome this.

Please find the presentation of Harm-Jan van der Beek here

Jan van Unen (Elanco) on innovations in animal health. Elanco focuses on food and companionship (pets) enriching life, through quality animal feed additives, medications and other animal health innovations. Innovation is at the heart of their business. Advanced science, state-of-the-art equipment, time-tested methods and forward-thinking partnerships have resulted in breakthroughs. Examples are the first feed ingredient that increased milk production efficiency in dairy cows, nutrient-directing product for beef and swine, or phage product that targets *E coli* O157:H7. Elanco's aim is to have one innovation in animal health per specie per year. The Kexxtone case illustrates the innovation process that has lead to the company's successes. Kexxtone is an efficient way to solve ketosis in dairy herds. By looking at the customer's (hidden) pain, and the customer's need, it is investigated what the company can offer. Guidelines for innovation are:

Strategic fit of the product (in Kexxtone: the vital 90 days)
Potential sales (> 25% of dairy cows)
Regulatory barriers (class, data required)
Supply (production)
Market Access (barriers, global acceptance)
Technical (application)
Commercial (value for the farmer, the vet and for Elanco)

A critical factor often hampering innovation is regulation, therewith creating uncertainties for the pharmaceutical industry, leading to less access to innovations that can provide more environmentally sustainable production, agricultural leadership positions and improved animal welfare.

Please find the presentation of Jan van Unen here

Theo Hoen (Vencomatic Group) on innovative farm systems.
The Vencomatic Group originated in 1983 in the Netherlands with a request by local poultry farmers for an automated egg-collection system. In addition to laying nest, Vencomatic developed new products for breeder hens. Several innovations followed, such as new stables for greater welfare and solutions for saving energy. With the EU ban on caged chicken, Vencomatic developed the Rondeel system: a round stable for free range chickens, combining the needs of the consumer, society, hens, poultry farmers, resulting in the most sustainable eggs available in the supermarket.

Vencomatic's innovations always start with a great idea for improvement. While working on new products, they always keep in mind the environmental sustainability (minimal emissions, minimal waste, optimal energy use), efficient growing (excellent feed conversion, easy and fast cleaning, minimal labour) and healthy chickens (excellent start for chickens, ideal climate, no antibiotics).

Excellent cooperation with universities and industry partners has been key in the successes.
To support industries in innovation, a few aspects are crucial:
Banks: financial support.
Supermarkets: no fear for long-term agreements.
Industry: consumer education.
Authority: support the agricultural industry to innovate.
NGOs: open dialogue.
This all requires: endurance.

For the presentation of Theo Hoen, please contact the ATF Secretariat

Innovative farmers and industry – looking back at ATF/EAAP Special Session 'Innovative farmers'

During the Annual Meeting of the European Association of Animal Sciences (EAAP), the Animal Task Force organised a session that was focused on innovative farmers. Four farmers from across Europe presented their view and experience with innovation in the agricultural field. During this Seminar, we look back at this session with one of the participants to link the experiences of farmers with the industry.

Charlotte Johnston (Royal Agricultural Society of England)

Why is research and innovation important for farmers? There is a risk of falling behind with other industrialised countries. Whilst post-farm gate industry (i.e. agrifood industry) has had significant growth, pre-farm gate productivity has remained static. There are some barriers in on-farm innovation and to bringing new knowledge to value. The traditional research cycle moves from Basic research (how a plant or animal works) into Applied research (how can we use that knowledge to improve farm performance) and then onto the farm through Extension and Advisory services. While most basic research is world-class, there hasn't been much support to applied research and extension services in the past decades. Getting information out on the farm hasn't taken place as much as it should do, as the knowledge transfer in research projects often happens at the end of the project. Up until recently, European funding has focused on research alone, without providing incentives for this research to be taken into practice. The European Innovation Partnership can provide change in this.

The experiences that were shared during the EAAP special session on Innovative Farmers underline this development.
Farmers and researchers need to work together towards a common goal. Collaborations is key for innovation. Working together can be challenging as farmers and researchers work on a different time-scale: where the entrepreneur needs fast and immediate results, the researcher can wait for months. Information sharing and knowledge transfer is also key for innovation to happen in practice, for example through farm visits, workshops and adequate information. This requires increased and independent advice and training by strong communicators, cross-border exchanges and on-farm demonstrations.

Please find the presentation of Charlotte Johnston here

'Necessity is the mother of invention. But is collaboration the father?'

Concluding panel discussion

With Iman Boot, Charlotte Johnston & John Oldham (emeritus professor SRUC) and the participant

Key challenges in innovation for the European animal production sector

Evidence-based policy-making

NGOs have a great influence on the public opinion and by doing so, on European policy. This can be a hurdle for innovation. Policy-making, and also the work of NGOs, should be more evidence-based. There is a role for researchers to play here: scientists need to put effort in influence policy-making by informing politicians, policy-makers and end-users about research results. In addition, there is a need to find an **inclusive innovation model** to work together with NGOs and societal organisations. Enthusiastic engagement is what we need to be looking for: include NGOs in the innovation process so that they are not a barrier.

Putting the (needs of) individual farmers and companies central

In innovation processes it is found difficult to put individual companies or farmers central, rather than bigger European industry organisation. Representative organisations serve as first contact person for farmers or other end-users. To reach individual farmers, there is a need to have custom-made **workshops and adequate training** to have new technologies be adopted by farmers.

Subsidies & Regulatory environment

An aspect that can hamper innovation in practice are subsidies. Highly innovative sectors are often not he subsidised ones The current regulatory environment does not boost innovation. New Zealand has a highly innovative agricultural system and is said to have one of the best regulatory environments for innovations, which is risk-based rather than results-based.

How can we turn the excellent research being done in Europe into excellent practice?

Excellent research, excellent practice

The current Horizon 2020 portfolio distinguishes three categories of support. One for societal challenges, one for industrial leadership, and one for excellent science. While this gives the impression that only fundamental research is excellent, all

research, including applied research, being done should be excellent. This will enable turning excellent research into practice. The European Commission is trying to stimulate this with the EIP.

Talking 'different languages'
Researchers, policy-makers, industry, farmers all talk 'different languages', making it sometimes challenging to work together. There should be attention to this to turn research into innovation in practice. A strong communicator is needed to translate research and farmer languages.

How can industry and research together work on a more sustainable sector?

Learning process
In his key note speech, Philippe Baret addressed the learning process that innovation needs: it is important for innovation to get the opportunity to fail. Also industry and researchers need a learning process to work effectively together, a challenging process as their incentives (resp. publications and making business) and time-scale might differ.
In the EIP allows partners to try and fail in the innovation process. There will be no punishment in funding.

(Optimise) funding by working together
One way to support innovation is to provide funding. The EIP aims to stimulate researchers and farmers and industries to work together by providing funding. The budgets available at EU level are however around 5% of the research funding available in Europe. It should be aimed to use available resources better. There are a tremendous amount of scientist in Europe and even so the number of facilities. Effectivity can be increased by sharing our knowledge and facilities better and to connect with each other. There are some motivating examples of research organisation managing to work across borders and share facilities. The Animal Task Force is exactly supporting this cooperation by bringing together industry, farmers and researchers to work on research and innovation for a sustainable livestock sector.

Concluding remarks

How can we put the 'i' in livestock? That was the main question for today. Innovation is needed to address the societal challenges Europe and the animal production sector is facing in an economic efficient way.

We have learned from practical examples that the regulatory environment and subsidies can be hurdles to stimulate investments in innovations. To support the innovation process, 'orgware' and 'software' aspects of innovation should be taken into account. Where necessity is the mother of innovation, cooperation should be the father. This requires strong communicators to translate the excellent research being done in Europe into practical solutions that will support a sustainable and competitive livestock production in Europe.