

Top Sector Agri & Food innovation agenda 2016 – 2019

Facts, Figures & Ambitions



Developments in the world

Our world and the Agri & Food sector are facing enormous challenges. In 2050, 9 billion people will need to be fed; moreover, thanks to increasing prosperity, their consumption will exceed and differ from that of today. At the same time, the amount of agricultural land available is declining and raw materials such as water and energy are becoming scarcer.

Furthermore, consumers and society at large are placing ever greater demands on the quality of products and the way in which they are produced. In tomorrow's world, consumers will not only want to eat sustainable, flavoursome food, they will also want food that is safe and healthy. Innovative solutions are needed to meet these challenges.

The 'Top Sectors' policy

The Netherlands Agri & Food sector is one of the economic sectors deemed by the Ministry of Economic Affairs to be a Top Sector. These sectors are the ones in which the Netherlands plays a leading role globally. Government, the business community and knowledge institutions work together within a top sector with a view to strengthen that sector internationally.



Our contribution

The Dutch Agri & Food sector has accrued decades of expertise as a result of the situation specific to the Netherlands, i.e. relatively little available land, high labour and production costs in a densely populated country with a very demanding public in respect of the environment, animal welfare, biodiversity and quality of life.

The upshot of this is that we have become innovative, highly productive, and technologically advanced. Thanks to expertise and innovation we have attained high levels of production while having the lowest possible impact on people, animals and the environment. As a result, we have developed into world champions in terms of sustainable, safe food of high quality and, what is more, at a competitive price.

Using technological and social innovations, farmers, entrepreneurs, government, scientists and social organisations are working together every day to ensure that flavoursome, healthy and safe food is being produced with care. We do this by developing sustainable food systems with a focus on health, flavour and products that support a healthy lifestyle. By sharing our expertise and ability worldwide in terms of safe and efficient production, we are making our contribution towards global food security.



Added value

€42 bn
7,3% NL



Production

€124 bn
10% NL



Number of companies

135,600
9,9% NL



R&D expenses

€0,8 bn
11% NL



Export value

€55.8 bn
13% NL



People employed

641.000
9,1% NL



Agri&Food
World market
share 6,6%

Safe and healthy food for 9 billion people in a resilient world

Innovations in the Agri & Food sector focus on a positive and healthy future. Dutch productivity, quality and safety of food have been responsible for the sector's leading position globally.

Worldwide research places the Netherlands at the top of the global food table, having the world's healthiest, most varied, affordable and nutritious diet. The Netherlands is the world's second largest exporter of food in the world and is increasingly exporting its expertise and technology. As a result, the sector's power is growing and we account for 10% of the Dutch economy and employment.

Our ambition is to retain and strengthen this global top position, to consolidate the sector, to help the economy and the quality of life in the Netherlands, to support healthy lifestyles and to contribute to the food security of the world – a world that will need more food in the next 40 years than it has needed over the past 4,000 years.

Agri&Food is an internationally leading, sustainable sector that is contributing towards prosperity and health.

We are growing thanks to our innovation, expertise and entrepreneurial spirit. The sector is vitally important to the Dutch economy, employment and health, and it is contributing towards the world's food security.

- **International leadership through the export of products, expertise and technology**
- **Public support thanks to contribution to prosperity and health**

through sustainable, innovative food systems

More with less

Higher added value

through the export of products, expertise and technology

International leadership

through focus of innovation on health, sustainability, flavour and convenience

- **Demand-driven research & innovation**
- **Active role of government in strengthening the global export position**
- **Greater inflow of a well-trained workforce**
- **Strengthening of public support**

Strength through connecting

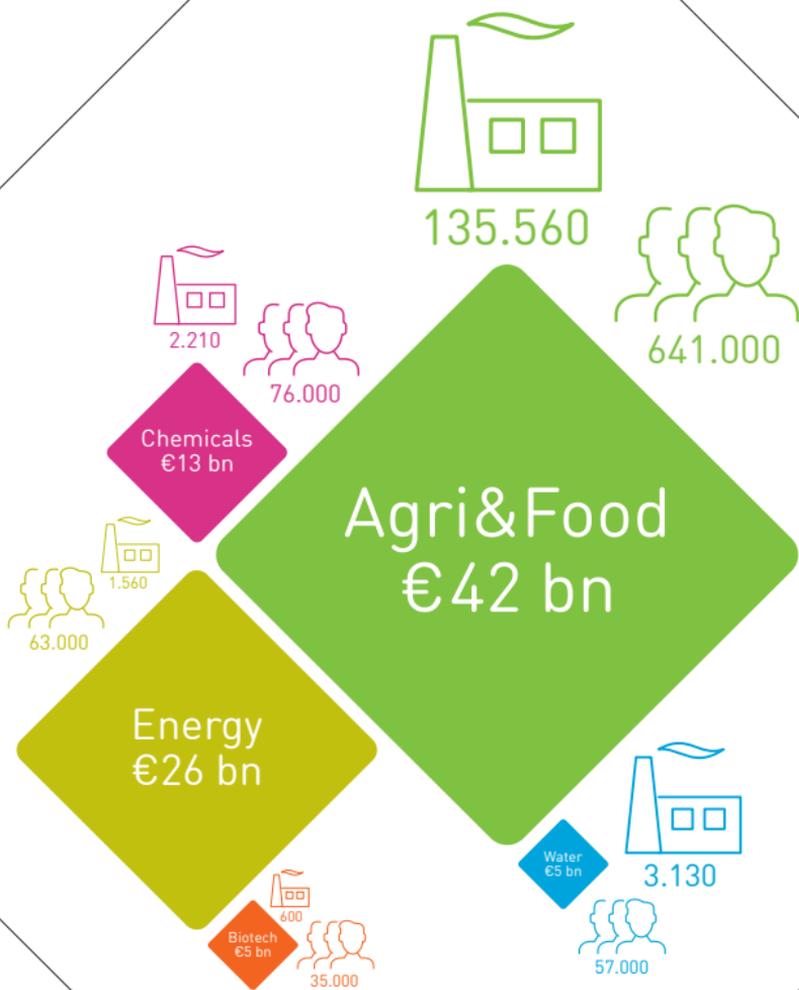
The sector's power

The Agri & Food sector is a powerful engine driving the Dutch economy. In total, the sector generates € 42 billion in added value, € 29 billion of which comes from primary production, manufacturing industry and suppliers, and € 13 billion of which from distribution, retail and the catering sector.

This makes Agri & Food the largest manufacturing sector in the Netherlands and it is responsible for almost 10% of the Dutch economy and employment. Billions of euros are invested each year in research and development within the sector, several hundred million euros of which are invested in public-private partnerships. The sector is comprised of 135,000 companies.

The Agri& Food sector accounts for 13% of Dutch exports. These exports include not only products but also, and increasingly, expertise and technology. The sector is the second largest exporter in the world (after the United States).

Our focus is on annual growth of 3% in terms of added value and of 5% in terms of exports. Consequently, we wish to structurally outperform the rest of the Dutch economy. This makes us a robust cornerstone of revenue and employment opportunities.



Results

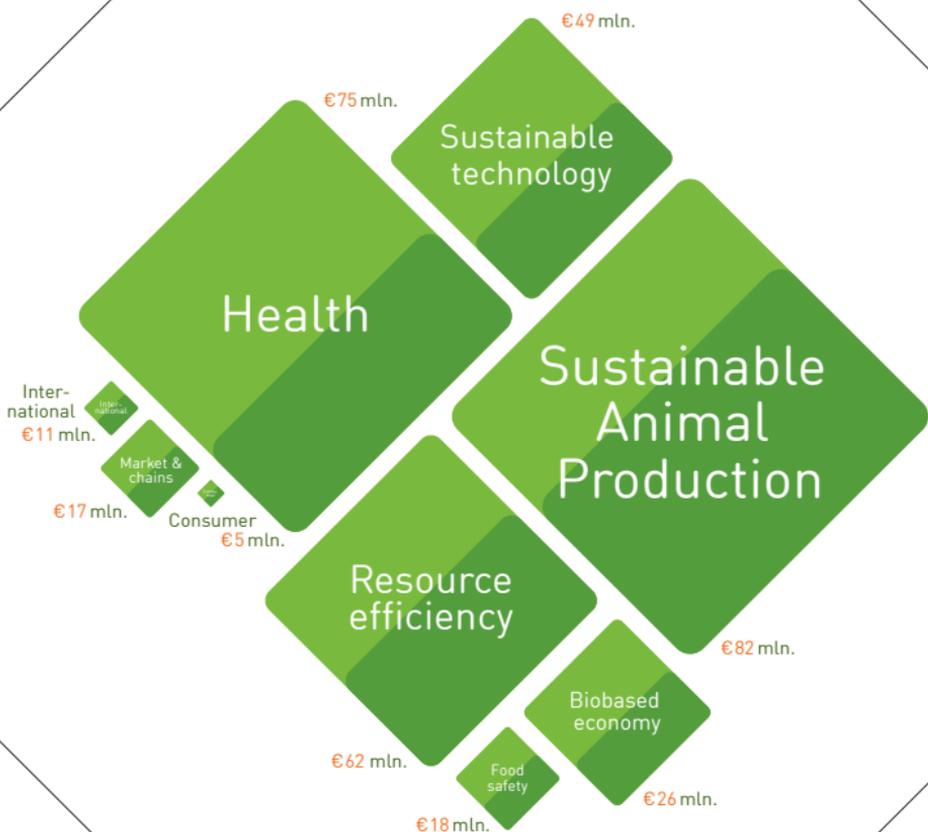
The impact of Agri & Food on the economy and society is set to increase over the next few years. The new innovations agenda indicates the areas in which we shall be investing in order to satisfy demand in society and to allow us to meet worldwide needs.

The agenda goals for the sector are:

- More with less: innovations in sustainable food systems with less use of raw material per kilogram of product and lower emissions of greenhouse gasses.
- Higher added value: developing high-quality food with the focus on health, flavour and convenience.
- International leadership through the export of products, expertise and technology.

2012-2015

public/private
partnership
Wageningen UR,
TNO, TIFN
en CCC



400 companies,
300 of which SMEs



We are doing this by:

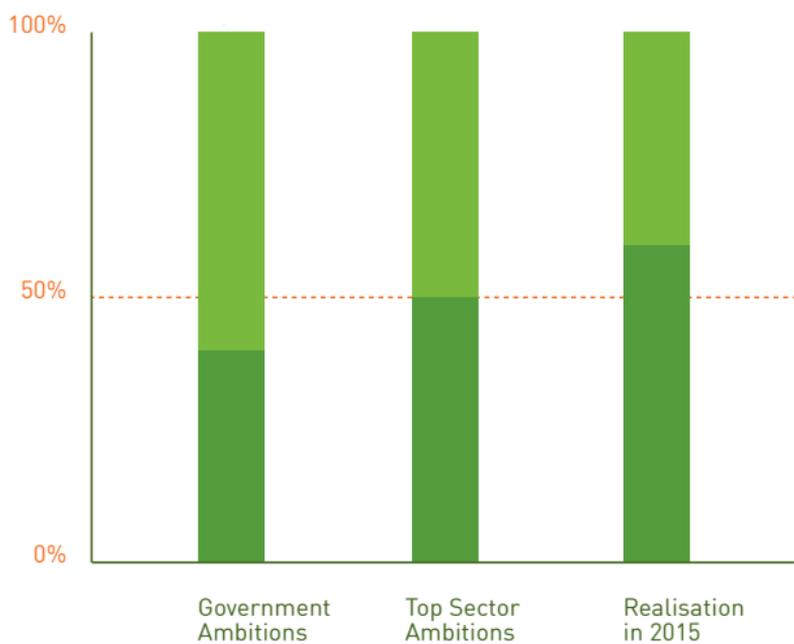
- Gearing the research by knowledge institutions to the needs of companies in the sector and society. By this means we can promote an increase in innovative strength.
- Focus on joint investment in innovations that meet the three goals and which thus support the goals.

Collaboration has resulted in:

- Better coordination between the business community, government and research.
- Substantial investment in research by the business community.
- Major steps towards the sector's further consolidation. The important issues are sustainable livestock breeding, health, the recycling of materials and the efficient handling of scarce raw materials.

2012-2015

government ambitions
sector ambitions
and realisation
in 2015



Innovation Agenda 2016–2019

The agenda for the next four years has the following priorities:

- More cohesion and integration: better connecting the sector's innovation roadmaps with one another;
- Collaboration and cross-pollination with other sectors and areas of expertise: crossovers;
- Further transition and consolidation: e.g. smart farming, safety and health.

Growing global demand and the limited quantity of raw materials require a model of agriculture that handles these scarce (and thus costly) resources with the utmost efficiency. An agrifood sector with precision technology, robotics and genomics. Safety is becoming ever more important to consumers. This also implies providing information honestly and transparently. A healthy diet can provide solutions to diseases associated with high age and a prosperous society, such as diabetes and obesity. Furthermore, the agenda is focussing on creating a more circular production system (e.g. a biobased economy, phosphate recovery and waste reduction), the dependence on imported raw materials, reducing impacts on climate and biodiversity, and a targeted approach to tackling animal diseases and resistance to antibiotics.

Safe and healthy food for 9 billion people in a resilient world

by means of:

- Innovative food systems
- Focussing on safety, health, sustainability, flavour and convenience
- International leadership through the export of products, expertise and technology

Food
Safety

Robust
Crop
Production

High Quality
Products

Smart
Agri & Food

Consumer
& Supply
Chain

Biobased
Economy

Sustainable
Animal
Production

Food and
Health

Internatio-
nalisation

Roadmaps

◆ Robust Crop Production

The growth of the world's population requires additional efforts to be made to improve production productivity and, along with this, the efficiency with which raw materials and resources are deployed: resource efficiency. Reducing impacts on climate and being responsible for biodiversity. Healthy soil.

◆ Sustainable Animal Production

Here, too, the issue is one of handling scarce raw materials as productively and efficiently as possible, as well as ensuring the minimum emission of greenhouse gasses. Proper, safeguarded animal health and welfare, safety for people working with animals, environmental safety and the safe production of animal products for the consumer.

◆ High Quality Products

This issue presents two challenges: improving public health and increasing the sustainability with which food is produced. Product technology is essential in that regard. Of key importance to this issue is the development of knowledge regarding high-quality products in which flavour and texture are optimised. This should be combined with requirements regarding sustainability, food safety and health, as well as the technology to produce these products sustainably while retaining the healthy properties of the end product. In other words, finding ways to produce foodstuffs with, for example, fewer raw materials, less energy and less water.

◆ Food and Health

Research into the relationship between food and health with an optimal, personal choice of diet as its objective. Healthy food can provide solutions to diseases and ailments associated with a prosperous society, such as diabetes, heart and vascular diseases, and being overweight. This roadmap concerns the development of food with less salt, sugar and fat, ageing healthily; food that is focused on its nutritional value to senior citizens and children, and on promoting a healthier lifestyle.

Roadmaps

◆ Food Safety

The Netherlands is famous worldwide for its high level of food safety. Food in the Netherlands has never been safer. Dutch consumers consider that food safety can be taken for granted. Food safety involves place of origin, itemisation of contents, safety, availability and quality. This roadmap is focussed on maintaining and, if possible, increasing consumer protection levels and minimising safety risks. New ingredients and new processing methods require additional research.

'The Netherlands is at the top of the global food table, having the world's healthiest, most varied, affordable and nutritious diet.'

(study by Oxfam Novib, January 2014)

Consumer & Supply Chain

This roadmap focusses on a healthy and sustainable society and increasing the quality of life. Important aspects to this include public support, a good relationship between society and the sector, and strengthening the relationship between people and their food. Society defines the boundaries in respect of animal welfare, nature, the environment and climate. These boundaries are subject to change and choices will be made accordingly. This roadmap will perform research into ways to strengthen communication with society and consumers. Consumer wishes and desires are the starting points for the sector's action. Research is being done into customer needs in order to meet them. Analysis is also being carried out on the way in which consumers make their dietary choices and how they can be influenced to choose a healthier lifestyle. Further to this, people, along with their social and physical environment, are themselves the subject of research.

Roadmaps

Internationalisation

The Netherlands is famous internationally for its high productivity, food quality and food safety. There is great demand from abroad for Dutch expertise and technology in this area. This roadmap uses this expertise to make good, healthy food affordable at the local level and to increase food production. For example, projects have been initiated using circular chains, locally implemented technological innovations and inclusive business.

Biobased Economy: together with the chemical and energy top sectors

Conscientious usage and better utilisation of natural (green) raw materials. The changeover to a circular economy is desirable from the perspective of sustainability. Research into the development of technology that makes new or adapted green raw materials possible for chemicals and energy: biorefining, e.g. new plants for green raw materials, obtaining greater yields from proteins, carbohydrates, oils and fats.

◆ Smart Agri & Food: together with the HTSM top sector and IT team

Technological developments in the field of data analysis ('big data'), robotics, system architecture and integration make Agri & Food smarter and more accurate. Agriculture can be handled and operated to scale and in specialist ways. As a result of this, there is an increase in health, quality, safety and productivity.

'70% of the production needed to meet growing global demand is going to come from technology.' (World Agriculture: towards 2015/2030, FAO report of 2008)

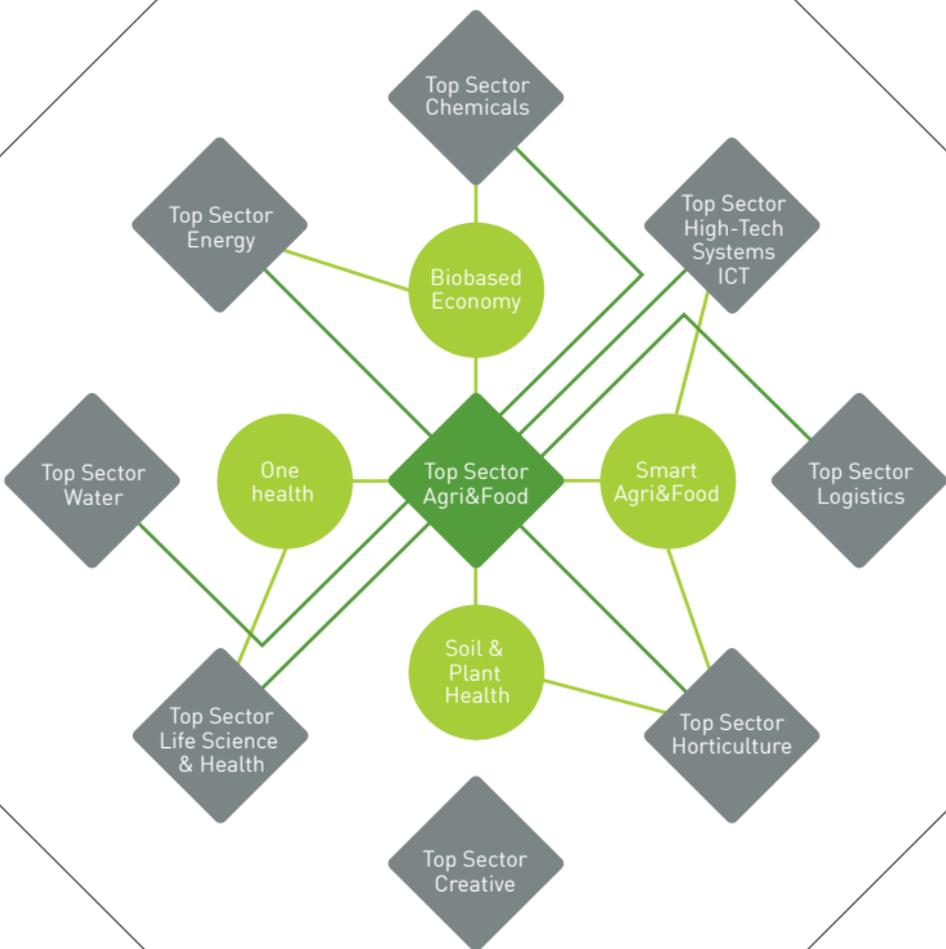
Crossovers

Innovations often arise through the application of expertise and technology from other domains and sectors.

The Netherlands Agri & Food sector has a history of putting to ingenious use developments in other sectors (ranging from mechanisation and water management to biotechnology).

Over the next few years, the Agri & Food top sector will be focussing chiefly on intensifying its collaboration in respect of the following issues:

- **Biobased Economy:** biomass as the raw materials for chemicals and materials;
- **One Health:** healthy people and animals by reducing resistance to antibiotics and infectious diseases;
- **Soil and plant health:** resilient and healthy soil and plants;
- **Smart Agri & Food:** integration of technology and food production.



Breed4Food

Challenges

Owing to growth of the world's population and changing dietary patterns, there is greater global demand for animal protein. At the same time, there is an increasing focus on sustainability, animal welfare and animal health. Breeding is a means of making a significant contribution towards the production of high-quality animal protein.

Our contribution

The most important breeding companies are working in partnership in the PPS programme 'Breed4Food'. By joining together, these companies are able to develop greater expertise in order to achieve higher efficiency, improved sustainability and improved animal health.

Project participants:

Cobb, CRV, Hendrix Genetics, Topigs Norsvin and Wageningen University & Research Centre.



Small-scale biorefining

Challenges

Waste flows and residues arise at various times during the processing of agricultural products, and they can contain materials that are well worth recovering by means of biorefining. However, current technology is profitable only when processing large-scale flows. For that reason, the present time is not ideal for the recovery of such valuable materials.

Our contribution

This project will develop innovative technology to make possible the small-scale biorefining of raw materials with a relatively high water content. Furthermore, maximising value is of key importance in terms of chemicals, materials, animal feed and bioenergy. Use of these refining technologies keeps water transportation at the minimum possible, allows minerals to be better recycled and boosts the rural economy. These technologies also provide attractive export opportunities.

Project participants:

AC Consult, Agro Proces Techniek, Algae Food & Fuel, Attero, Blue Agro Innovation, Delibugs Insect Europe, Dirkse Milieutechniek, DSD, Dun Agro, Duynie, GEA Westfalia Separator Nederland, Grassa, Innovatiecentrum Greenport Venlo, Membraan Applicatie Centrum Twente, Metaalwerk Arie Belo, NewFoss, Oosterhof Holman Milieutechniek, Orgaworld, Schiphol Area Development Centre, TOD Nijkamp and Wageningen University & Research Centre



Precision irrigation increase yield

Challenges

A more intelligent approach to water use can result in a considerable increase in production ('more crop per drop'). In some parts of the world, glaring water shortages are responsible for mediocre yields. This is expected to occur in more locations over the next few years, along with a forecast intensification of water shortages. Considerable additional improvements to quality can be achieved in the Netherlands through the use of precision irrigation.

Our contribution

In a project aimed specifically at SMEs, a sensor has been developed that indicates precise water needs for any given plot of land. Crop farmers can get this information online and are able to react promptly to changeable situations. As a result, crop farmers in dry regions can provide optimum sprinkling (making water usage savings of up to 50%), while crop farmers in the Netherlands can achieve considerable improvements to quality by pre-empting drought stress. The new 'Senseation' sensor is now on the market and is also being sold in the United States.

Project participants:

Dacom



Tackling obesity

Challenges

In 2012, 10% of the adult Dutch population were considered to be seriously overweight. This condition leads to a variety of medical problems. Each year, efforts to tackle these problems cost € 1.2 billion. Obesity accounts for a further € 2 billion in direct social costs.

Our contribution

Several projects are in progress concerning the issue of obesity. This project is investigating whether wholemeal products have a greater satiating impact than other products. Should that indeed prove to be the case, this will open up opportunities for the development of new products that have a more satiating effect.

Project participants:

Nederlands Bakkerij Centrum, TNO



The innovation agenda was developed by the top consortium for knowledge and innovation (TKI) in collaboration with: Bionext, CBL, FME-Agrofood, FNLI, LLTB, LTO Nederland, LTO Noord, NZO, Veneca, Youth Food Movement, ZLTO, Ministerie van BuZa, Ministerie van EZ, Ministerie van I&M, Ministerie van VWS, NVWA, Agrifirm, Ahold, Avebe, Biopolymers, Cosun, Danone, DSM, Euroma, ForFarmers, FrieslandCampina, Heinz, Mars, Nevedi, Newtricious, Nutreco, RIVM, Rodenburg, Unilever, Vion, Rijksuniversiteit Groningen TNO, Universiteit van Amsterdam, Universiteit van Maastricht, Universiteit van Utrecht, Vrije Universiteit Amsterdam, Wageningen UR.

The agreements and objectives that have been reached through platforms and alliances have also been incorporated within this:

- The Sustainable Food Alliance (Alliantie Verduurzaming Voedsel)
- The Sustainable Trade Initiative (IDH)
- Sustainable Livestock Breeding Implementation Plan (UDV)

The Agri & Food top team comprises:

Aalt Dijkhuizen (chairman), Hans Hoogeveen (Ministry of Economic Affairs), Marit van Egmond (Albert Heijn), Piet Boer (FrieslandCampina), Ruud Huirne (Rabobank), Jan van Rijsingen (MKB), Joris Baecke (LTO Nederland), Robert Smith (Cosun) and Raoul Bino (Wageningen UR).

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