General programme

	Orion restaurant, ground floor (Atlas side)
08:30	Registration and welcome drink
	C1032
09:00	Opening by WIAS Science Day 2017 Organizing Committee
09:05	Welcome by Prof. Johan van Leeuwen (WIAS Scientific Director)
09:15	WAPS Council
09:20	**Keynote speaker 1: Imke de Boer (Wageningen University)** A sustainable food system: what role do animals play?
10:00	Poster Pitch
	Orion restaurant, ground floor (Atlas side)
	Coffee break
	C2030, C1032, C2035
11:00	Morning presentation session
	Orion restaurant, ground floor (Atlas side)
12:00	Lunch
13:00	Poster session
	C2030, C1032, C2035
13:30	Afternoon presentation session
14:30	***Orion restaurant, ground floor (Atlas side)***
	Coffee break
	C1032
15:00	**Keynote speaker 2: Ian Givens (University of Reading)** Milk and dairy products: Sustainable dietary partners for life?
15:40	**Keynote speaker 3: Cees Leeuwis (Wageningen University)** How do societal transitions come about and how can we support their emergence?
	The SPOT
16:30	Drinks and award ceremony
18:00	Dinner
19:00	Pubquiz
±20:30	End

Presentation sessions

		Orion C2030	*Orion C1032*	*Orion 2035*
Morning presentation session		**Sustainable animal production system** (Nutrition and genetics) Chair: Nazri Nayan (ANU)	**Improving animal health** (Prevention of animal disease) Chair: Carmen Embregts (CBI)	**Interdisciplinary approaches** (Sustainable development in context) Chair: Tom Berghof (ADP)
	11:00	Maarten Hollemans (ADP/ANU) Effects of early nutrition and transport of one-day-old chickens on production performance and behavior	Sandra Vreman (CBI) Differential responsiveness of TLR 1/2 and TLR 9 stimulation of neonatal and adult porcine dendritic cells	Evelien de Olde (APS) Contribution of farm-level assessment tools to sustainable development of agriculture
	11:20	Sabine van Engelen (ABG) Genetic background of predicted methane based on milk mid-infrared spectra of Dutch Holstein Friesian cows	Floor Biemans (ABG/ QVE) Digital Dermatitis in dairy cattle, contribution of different classes to transmission	Mariska van Asselt (ADP) Arguments in a dilemma between laying hen welfare and food safety
	11:40	Kasper Janssen (ABG) Economic benefits of selective breeding for gilthead seabream	Novi Mayasari (ADP) Relationship between Vaginal Discharge with Inflammatory Biomarkers and Oxidative Stress in Dairy Cows	Wassie Molla Abebe (QVE) Field study on Kenyan sheep and goat pox virus vaccine efficacy in controlling lumpy skin disease outbreak and its impact on reducing disease severity

Afternoon presentation session		***Orion C2030***	***Orion C1032***	***Orion 2035***
		Sustainable animal production system (Behaviour and welfare) Chair: Lies Zandberg (BHE)	**Improving animal health** (Breeding for survival) Chair: Robert Onzima (ABG)	**Interdisciplinary approaches** (Modelling of biological system) Chair: Soumya Kar (HMI)
	13:30	Ingrid van Dixhoorn (ADP/FTG) Behavioural patterns as an indicator for resilience of dairy cows	Tessa Brinker (ABG) Genome-wide association study for direct and indirect genetic effects on survival in crossbred laying hens	Cees Voesenek (EZO) Bending moment dynamics during swimming of developing zebrafish larvae
	13:50	Iris Boumans (APS) Simulating pigs to understand their behaviour	Martijn Derks (ABG) Lethal recessive haplotypes in commercial livestock breeds	Mike Fleuren (EZO) Pregnant as a prey: performance and kinematics of the 3D fast-start escape response of live-bearing fish
	14:10		Tom Berghof (ADP/ABG) Chickens selected for different natural antibody levels differ in mortality to intratracheal aerial pathogenic *Escherichia coli* (APEC) infection	Pascal Duenk (ABG) Benefits of dominance over additive models for the estimation of average effects in the presence of dominance

A sustainable food system: what role do animals play?

Prof. Imke de Boer
Animal Production Systems, Wageningen University

The challenge to produce enough nutritious food for a growing and more prosperous population in a sustainable way is currently broadly acknowledged. It is now also largely undisputed that the animal sector uses a great deal of our natural resources, and contributes significantly to environmental issues. What role, if any, animals do play in an environmentally sustainable food system, however, is heavily debated. My aim is to show different narratives about the future role of animals in an environmentally sustainable food system, as outlined in the scientific literature, and to discuss underlying arguments, values and beliefs. One dominant narrative is "we need to produce more animal-source food (ASF) with less environmental impact". Research that addresses this so-called **production narrative** explores opportunities to reduce the environmental impact per kg of ASF produced, and contributes to what is currently known as sustainable intensification of animal production. Solutions suggest, for example, a transition from grass-based to mixed feed-crop livestock systems, and breeding of high yielding animals. Another dominant narrative is "we need to consume less or even no ASF, or ASF with a lower environmental impact". Research that addresses this so-called **consumption-narrative** focuses on changing human consumption patterns by reducing or avoiding consumption of ASF, or shifting from ASF with a high impact, such as beef, to ASF with a lower impact, such as chicken, fish or insects. Solutions presented suggest that shifting to a vegan diet has most potential to save the planet. Current studies that address the production or consumption narrative, however, do not acknowledge the complexity of the food system, such as the competition for natural resources between humans and animals or the interlinked production of, for example, wheat grain and straw, or milk and meat. A relatively new narrative is "animals are essential for resource-efficient food production, as they can convert biomass inedible for humans into nutritious ASF". Research that addresses this so-called **circular narrative** shows that natural resources are used most efficiently if animals are fed on biomass inedible for humans mainly, also referred to as leftovers. The amount of ASF that can be obtained from leftovers, however, depends on their type and availability (e.g. by-products of food industry, food waste, crop residues, grass from marginal land), and their utilization potential by animals. The conclusion that consuming a small amount of ASF is most efficient from a natural resource use perspective contradicts the conclusion from the consumption-narrative that a vegan diet is most resource efficient. Similarly, according to the circular narrative, low-yielding ruminants grazing marginal land can be more resource-use efficient than high-yielding ruminants fed grain and maize silage (best from the production narrative) or chicken eating grain (best from the consumption narrative). The circular narrative, however, also demonstrates that developed countries have to significantly reduce their consumption of ASF. Understanding that our view on what drives the problem determines our solution is an important first step to move "beyond sustainability".

Imke J.M. de Boer graduated cum laude from Wageningen University in 1989 and holds a PhD in Animal Sciences from Wageningen University (Animal Breeding and Genetics) since 1994. After her PhD, she joined the Animal Production Systems group, which she is chairing since September 2011. She is a leading expert in the domain of environmental sustainability of animal production systems.

Milk and dairy products: Sustainable dietary partners for life?

Prof. Ian Givens
Food Chain Nutrition, University of Reading

Public health nutrition is facing many major challenges which will shape food-related policy for decades to come. These include the rapidly increasing burden of obesity, the increasing age of populations and the challenge of increasing world food production by some 50 % by 2030 to meet the increasing demands whilst minimising the effect on the environment. The first two issues in particular will increase the risk of chronic disease substantially and the third will have other, perhaps obvious risks. The marked rise in obesity and related type 2 diabetes is of particular concern since it is now also beginning to affect younger people (Nugent , 2004). In the UK, the Foresight Report on obesity predicts that by 2050 some 55 % of UK adults will be obese (Butland et al., 2007). These many factors mean that diet, an important moderator of chronic disease risk will play an increasingly important role. Food production in the future will therefore be a balance of many factors, sustainability/environmental cost, financial cost but crucially their role in reducing the risk of chronic disease. Animal-derived foods in particular have been highlighted as having a high environmental cost but much less attention has been paid to their role in healthy diets that have impact from childhood to old age. Whilst most people know that milk and dairy products are very important sources of dietary nutrients such as calcium and iodine, it is not widely known that due to reduced milk consumption many young females in the UK now have sub-optimal intakes of calcium and iodine especially during the critical life phases of adolescence and pregnancy with consequences already apparent. In addition there is much uncertainty in the public's mind about whether or not these foods contribute to increased risk of cardiometabolic (CMD) and other chronic diseases. The evidence from long term cohort studies that high milk consumption does not increase CMD risk and indeed may provide benefit is now pretty unequivocal, although the differential effects of the various dairy products including the benefits, if any, of fat reduced milk and saturated fat reduced milk are less certain. There is now good evidence that specific health issues related to children, pregnant women and the elderly can be alleviated by milk or components of milk and these effects are not all explained by traditional nutrition. They must however, be considered when debating future sustainable food production; for example, the simplistic replacement of milk proteins by plant proteins may not provide the same nutrients or long term health benefits.

Prof. Ian Givens has background training in biochemistry and nutrition and is currently Professor of Food Chain Nutrition and Director of the Institute for Food, Nutrition and Health at the University of Reading, UK. His research interests focus on food chain nutrition with emphasis on the relationship between consumption of animal-derived foods across the key life stages, nutrient supply and chronic disease outcome with particular emphasis on vascular disease and milk proteins, saturated, *trans* and *n*-3 fats. Current work focuses on lipids and proteins in milk and dairy products and their influence on cardiometabolic diseases. It also includes the use of animal nutrition to modify the lipid and other nutrient composition of these foods along with development of valid markers of chronic disease risk associated with consumption of normal and modified foods.

How do societal transitions come about and how can we support their emergence?

Prof. Cees Leeuwis
Department of Social Science, Wageningen University

It is widely agreed that becoming 'sustainable' will require major transformations in how natural resources (such as water, land, minerals and biodiversity) are used to generate services and products (such as food, fibre and energy) for mankind. This is often referred to as a need for 'transition'. But what precisely are 'transitions'? And why is it so difficult to bring them about? What can we learn from how transitions have happened in the past? How feasible is it to 'engineer' a transition? And what is it that we can do today to make transition happen in the longer term? It will be argued that transitions do not merely involve technological change, but that they require changes in how humans think and organise, leading to adaptation of the formal and informal 'rules of the game' in society. Hence, 'transitions' are socio-technical in nature. They involve many stakeholders operating at different levels and in different spheres, and encompass simultaneous change in a range of interrelated practices and behaviours. These features pose two major hurdles on the road to transition: (1) networks of stakeholders do not have a central locus from which socio-technical system change can be steered and controlled, and (2) stakeholders do not agree on the direction to be taken (for example, on what 'sustainability' should mean in a given context). Before thinking about how we can address these issues, it is pertinent to look at how transitions in socio-technical systems have happened in the past. Historians of technology often take an evolutionary perspective, and argue that at any given point in time, different socio-technical configurations 'compete' with each other and with the then dominant system in an ever changing selection environment. While there are often strong forces to maintain the 'status-quo', we sometimes see that coinciding changes in the environment (e.g. changes in prices, geo-political relations, societal demands, public pressures and/or new technical opportunities) can undermine the existing system or create windows of opportunity for alternatives. Hence, socio-technical transition is in many ways a social struggle, whereby the success of initiatives for change depends in part on the relative strength of the support network or coalition that advocates manage to forge. Another key process in the competition for survival and change is that initiatives learn effectively from their experiences and incorporate feedback from the bio-physical and social environment. To a large degree, major socio-technical changes in the past have not been planned and engineered, but are a product of 'self-organisation': the emergence of new orders without central steering and control, respectively the unintended outcome of numerous intentional actions that interfere with each other in complex ways. While the potential of engineering socio-technical transitions is limited, the historical perspective still gives us clues on what we as scientists and practitioners can do to stimulate transformation.

Prof. Cees Leeuwis graduated in Rural Sociology from Wageningen University in 1988. He is a professor in Communication and Innovation Studies and from 2012 onwards he became chair of the newly formed Knowledge, Technology and Innovation group. His works ranged from manure management and mastitis control, to pro-poor agricultural innovation, competition over natural resources, institutional change and malaria prevention. Current works focuses on the potential and limitations of mobile ICT in altering collective decision-making in crop, water, livestock and disease management.