Organic resilient animal farming systems to meet future livestock production challenges

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This presentation

Organic resilient animal farming systems to meet future livestock production challenges

Future challenges for European livestock production?

- to become free of what current livestock systems rely on – conventional and organic

- to transform sustainably:

- **Not degrade the environment**
- **Contribute to fair agriculture & food systems in a changing world**

What do we rely on in current European livestock production systems?

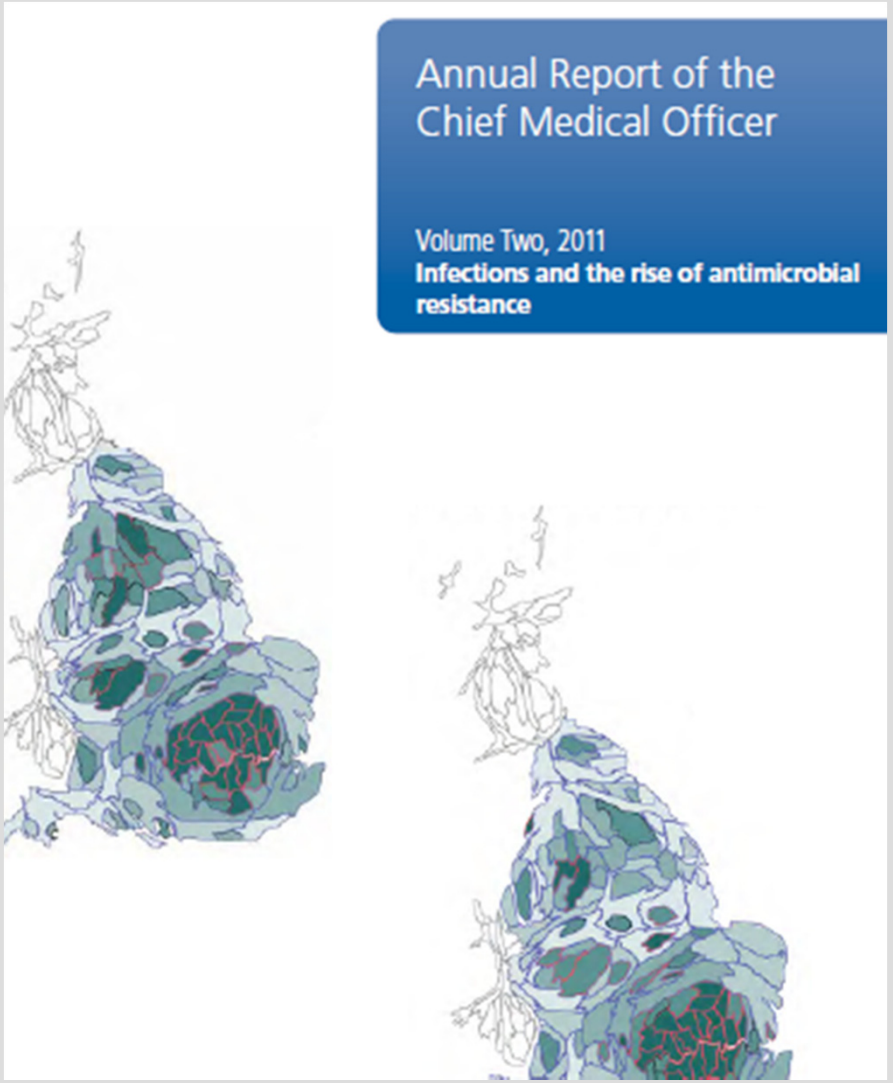
Reliance on imported feed

Reliance on fossil fuels

Reliance on antibiotics

… 1928: life saving
… 1951: systematic use

… and what now …?

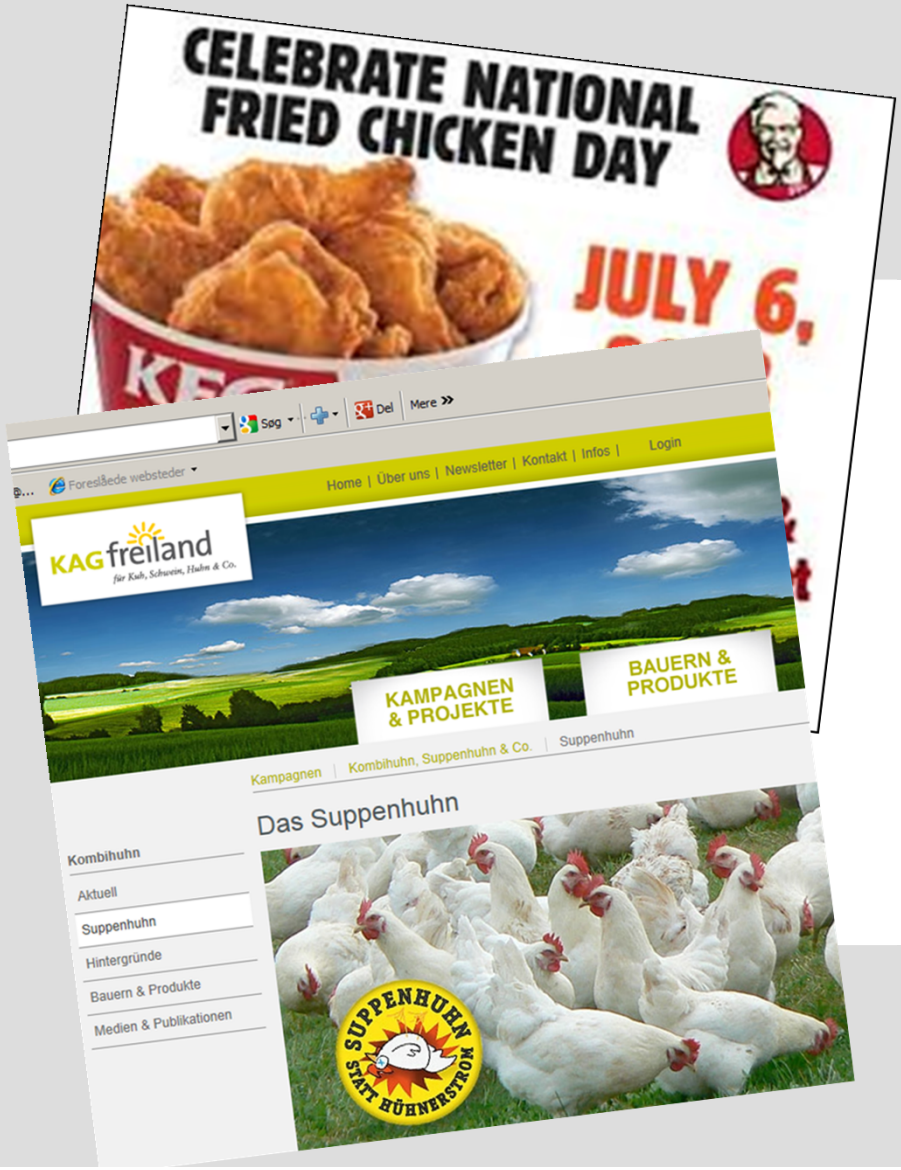


Reliance on few 'designed breeds'

- Dramatic decrease in genetic diversity
- 'Designed breeds' for specialised purposes
- Breeding goals not 'robustness focused'

Vermeer et al. (here): Effect of genotype, sow rearing system and outdoor access on piglet survival in extensive systems

We produce food that is so cheap that we can afford to waste a lot of it …



Reliance on an industrial model

'Shared suffering'

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Our partners:

- Animal products
- Cultural meaning
- Work
- ‘Systems partners’: manure, nature conservation …

ANIMALS

Living sentient beings

The alliance between humans and animals

The ethical contract

Sustainable animal husbandry

Journal of Agricultural and Environmental Ethics (2005) 18: 293–303
DOI 10.1007/s10806-005-1490-9

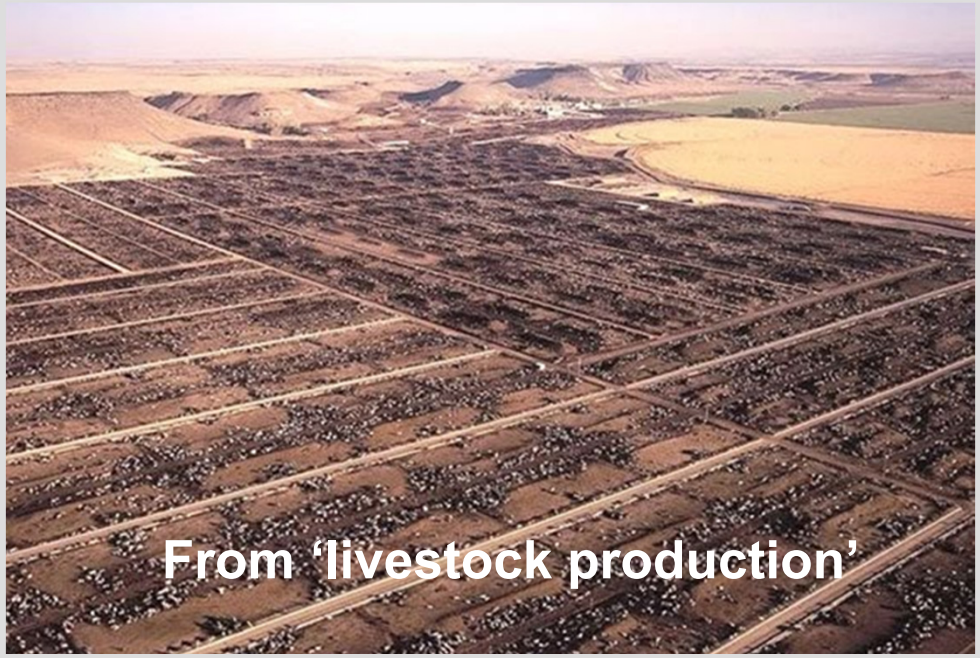
MICHAEL C. APPLEBY

SUSTAINABLE AGRICULTURE IS HUMANE, HUMANE AGRICULTURE IS SUSTAINABLE

' A collaborative approach to humane sustainable agriculture will benefit animals, people and the environment'

Organic resilient animal farming systems to meet future livestock production challenges

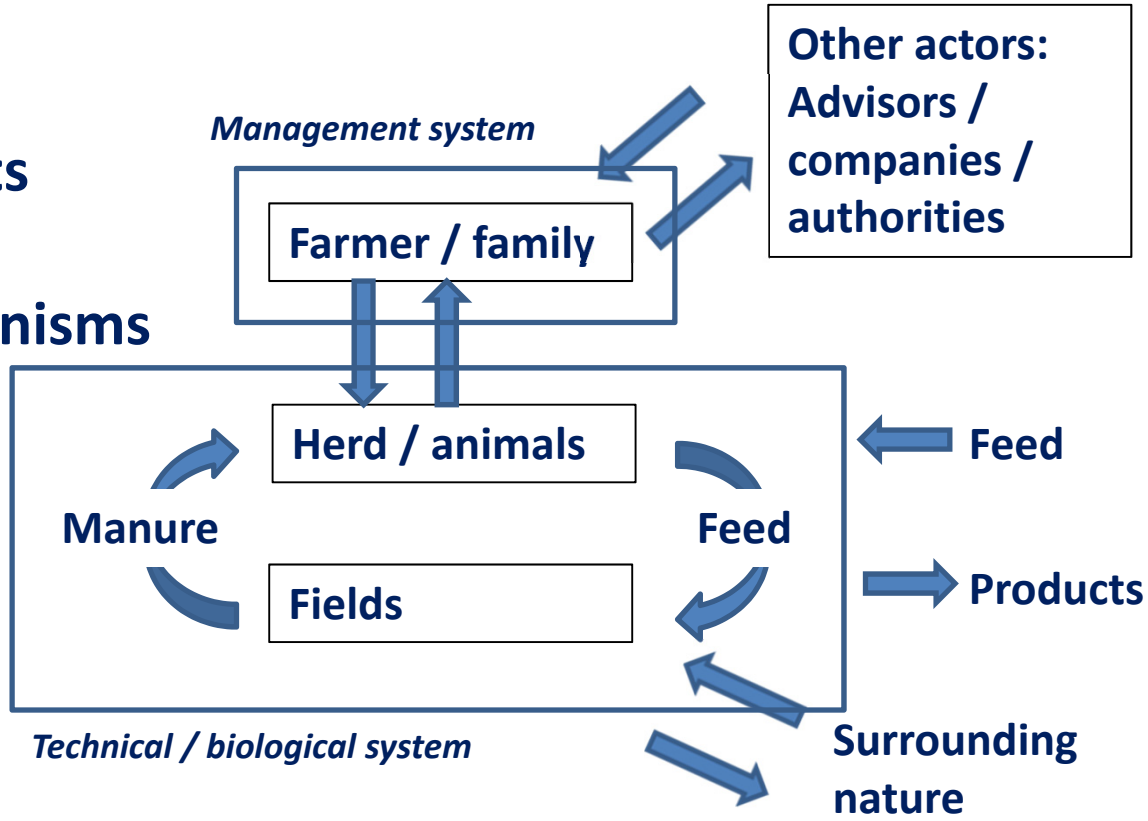
‘Animal farming systems’



Systems approach:
eco - , food - , agriculture - , social - …

Systems thinking:

- Interactive components
- Self-regulatory
- With feed-back mechanisms
- Resilient
- Consist of sub-systems and is part of bigger systems



'… more than a sum of its components'

'… more than mixed farming …'

Mixed / integrated

- **Mixed: 'co-existence' in the same system**
- **Integrated: 'interaction' and inter-dependency which benefits all involved**
- **Integration on more levels: complementary, local & territorial synergy** *(Moraine et al., ANIMAL, 2014)*

Grassland and ruminants a 'perfect match' in many agro-ecological systems

(Idel & Reichert, 2014; UNCTAD, 138-153)

‘Waste’ and ‘Pollution’ versus ‘Manure is gold’

From a systems view:

Synergy, benefits & ressources

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‘Organic’: living up to IFOAM principles

Linking to sustainability

PRINCIPLES of ORGANIC AGRICULTURE

Principle of HEALTH

Organic Agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.

Principle of ECOLOGY

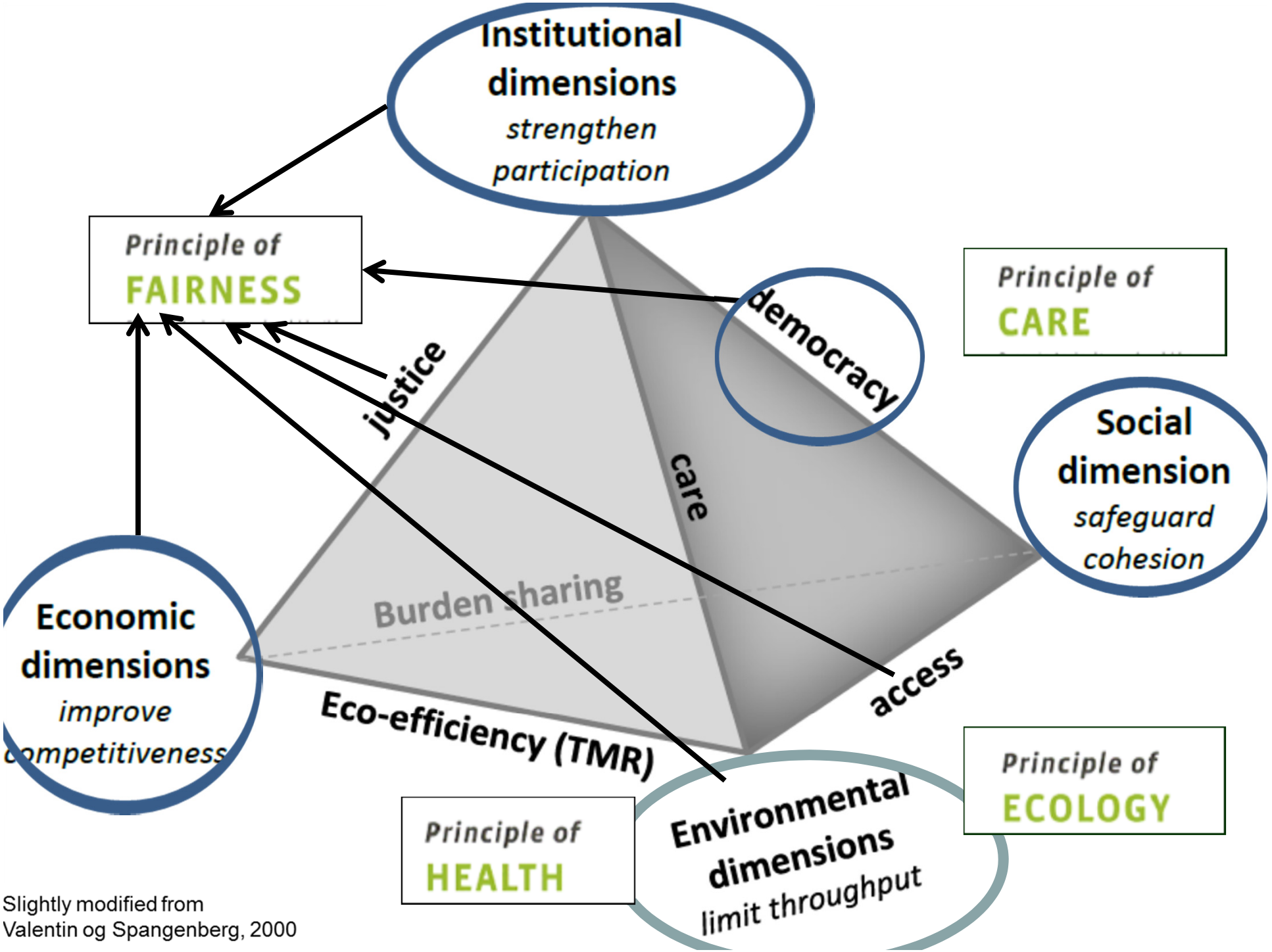
Organic Agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.

Principle of FAIRNESS

Organic Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.

Principle of CARE

Organic Agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.



Slightly modified from
Valentin og Spangenberg, 2000

Principle of HEALTH

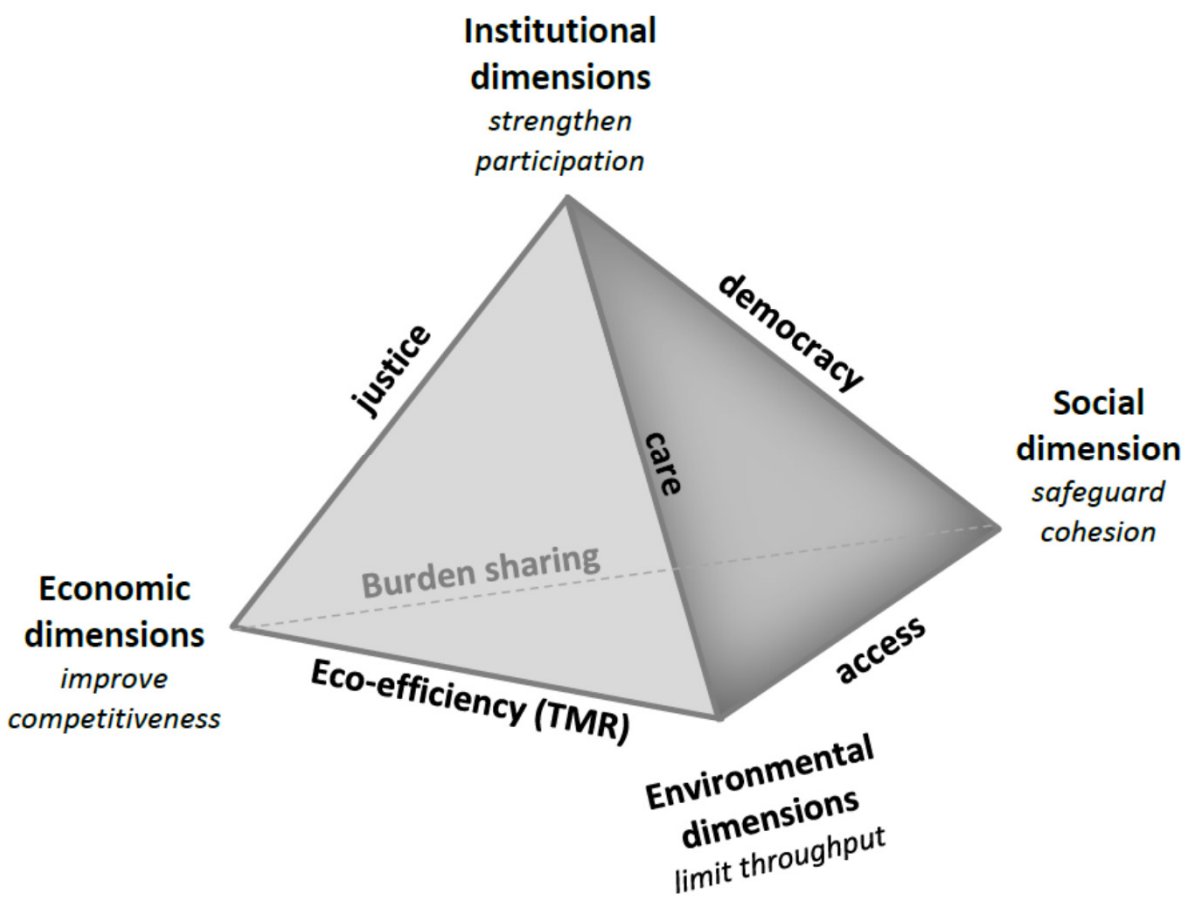
Principle of ECOLOGY

Principle of FAIRNESS

Principle of CARE

Organic agriculture is addressing sustainability

- and all its' dimensions ...



Oudshoorn et al. (here): What makes organic livestock sustainable?

Resilience

'... the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables ...'

(*Holling, 1973*)

Characteristics of a resilient system:

- Robustness
- Synergy
- 'Buffer capacity'
- Integrated elements
- Relevant to talk about for all systems: soil, plants, animals, humans, agro-eco-system

Resilience as a universal criterion of health

Döring et al., 2014,
Journal of the Science of Food and Agriculture

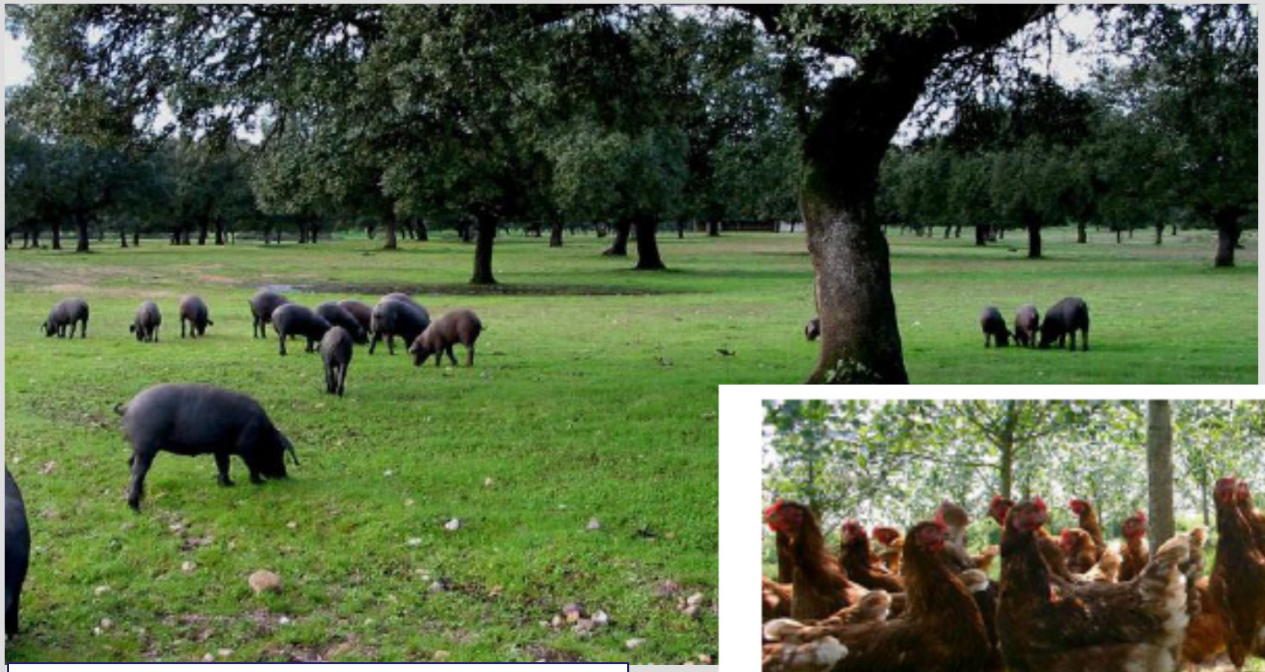
- **Robustness**
- **'Margin' / buffer capacity: react and withstand shocks**

Petersen et al. (here): Milk production and fatty acid content in milk on organic farms feeding three levels of herb silage

Williams et al. (here): Anti-parasitic effects of plant secondary metabolites on swine nematodes


Integrated agro-ecological /organic animal farming systems often associated with tropics
? relevant for European animal production systems?

Agro-forestry systems in Europe: good examples of organic resilient animal farming systems



Escribano et al. (here): Challenges and future perspectives of different organic beef cattle farms of Southern Europe

Woodland
FREE RANGE EGGS

‘Mixing’ gives benefits …

Example: trial on mixed grazing calves and pigs:

- **Live weight gain: Better in mixed systems for both animal species**
- **Grass intake better in mixed systems.**

Sehested, 2003

Crop-livestock integration to reduce reliance on external protein sources

Acta Agriculturae Scandinavica, Section A - Animal Science

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/saga20

Free-range pigs foraging on Jerusalem artichokes (Helianthus tuberosus L.) - Effect of feeding strategy on growth, feed conversion and animal behaviour

A. G. Kongsted [a] , K. Horsted [a] & J. E. Hermansen [a]

[a] Department of Agroecology, Faculty of Science and Technology, Aarhus University, Tjele, Denmark

Version of record first published: 19 Apr 2013.

Jakobsen & Kongsted 2014 (here): Performance and behavior of free-range pigs in relation to feed protein level and forage crop

Prunier et al. 2014 (here): Characteristics of the diets in organic pig production

Wallenbeck et al. 2014 (here): Mussel meal in diets to growing / finishing pigs – influence on performance and carcass quality

Livestock Science 150 (2012) 200–208

Contents lists available at SciVerse ScienceDirect

Livestock Science

journal homepage: www.elsevier.com/locate/livsci

Combined production of free-range pigs and energy crops—animal behaviour and crop damages

K. Horsted *, A.G. Kongsted, U. Jørgensen, J. Sørensen

Faculty of Science and Technology, Aarhus University, Department of Agroecology, P.O. Box 50, 8830 Tjele, Denmark

` … feasible strategy to benefit both the environment and animal welfare…'

Diversified farming systems with social / community aspects

Many examples throughout Europe:

- **Involving community**
- **Nature care + production**

‘Can together’ EU-FP7-project

‘… ecological modernisation… …participatory design … local context … ‘

Animal (2014), 8:8, pp 1204–1217 © The Animal Consortium
doi:10.1017/S1751731114001189

Livestock systems and land use: which diversity for which sustainability?

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* *corresponding author*

Farming system design for innovative crop-livestock integration in Europe

M. Moraine[1†], M. Duru[1], P. Nicholas[2], P. Leterme[3] and O. Therond[1]

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What do we need to transform into organic resilient animal farming systems to meet future livestock production challenges?

Necessary focus:

- Development and exchange of
  - Context specific knowledge: research and farmer action
  - Social community & practice
- Adressing governance

On farm and local community levels: inspiring examples and learning points

Veysset et al. 2014 (here): Organic livestock farming systems in the Central France: evolution of the performances and drivers

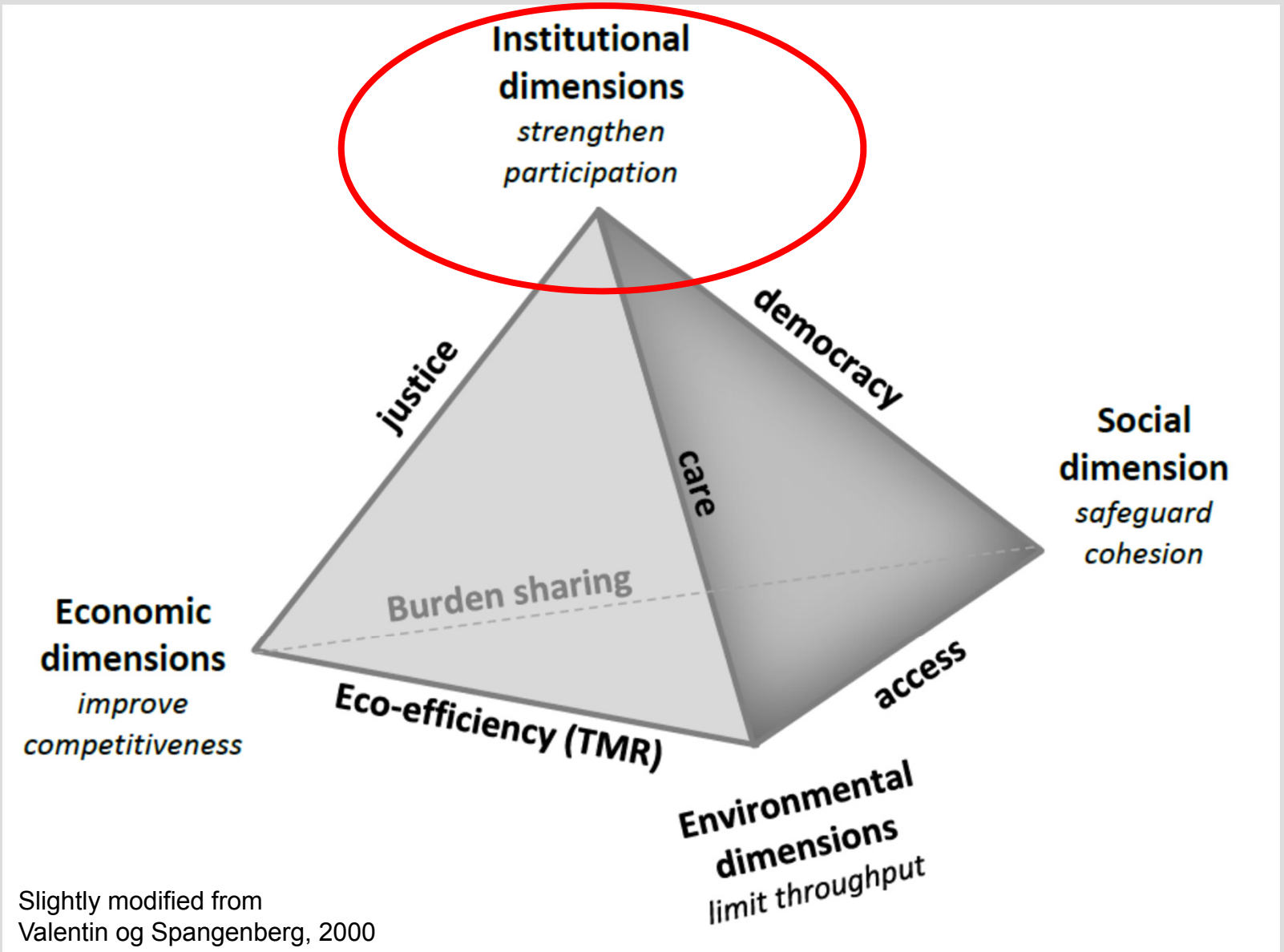
Complex integrated animal farming systems requires complex knowledge

The power and potential of farmer groups for exchange & development

Complex integrated animal farming systems requires complex knowledge

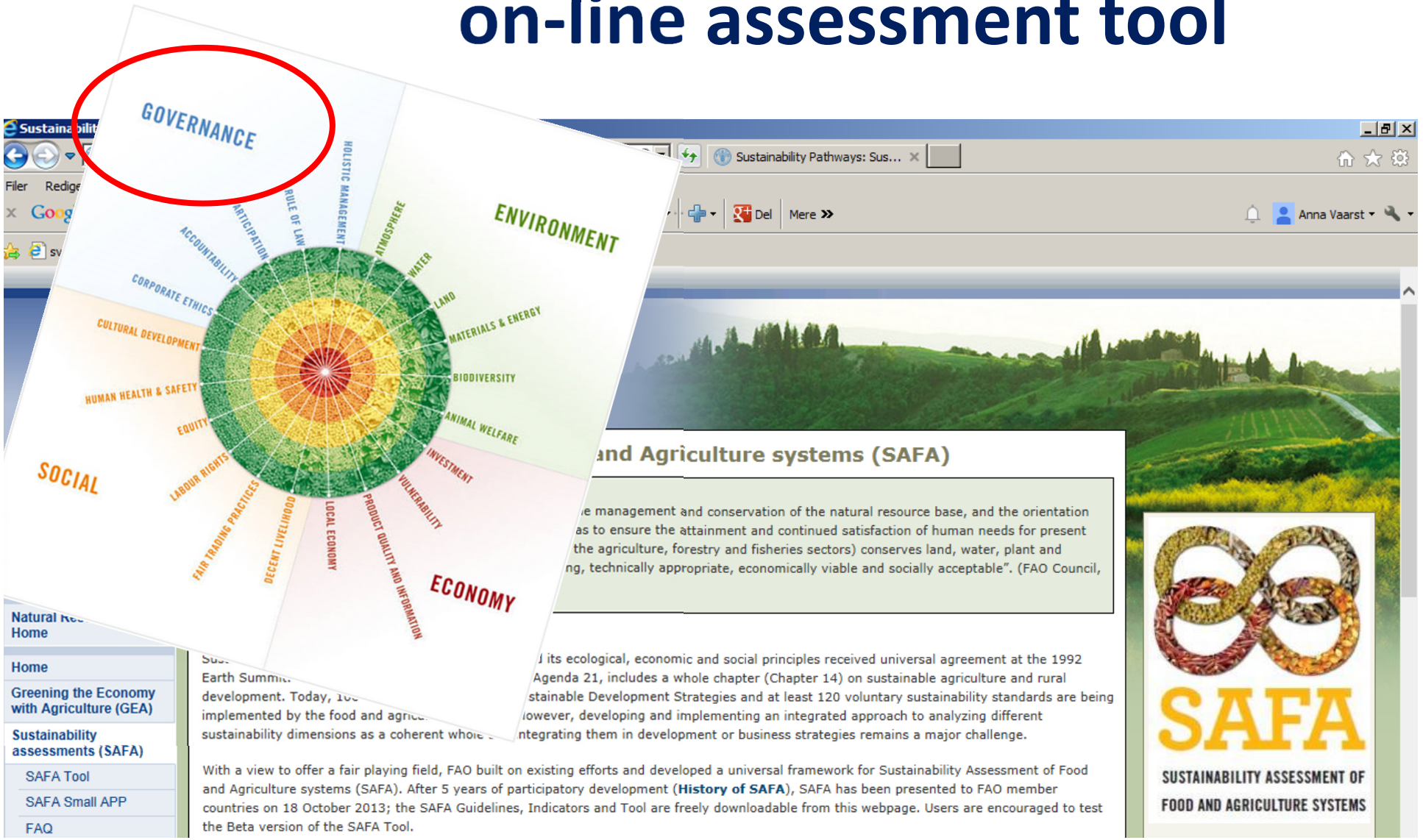
- Context specific
- Innovation and learning
- Education; involvement of all age groups
- Community development

Addressing governance



Slightly modified from
Valentin og Spangenberg, 2000

Sustainability Assessment on-line assessment tool

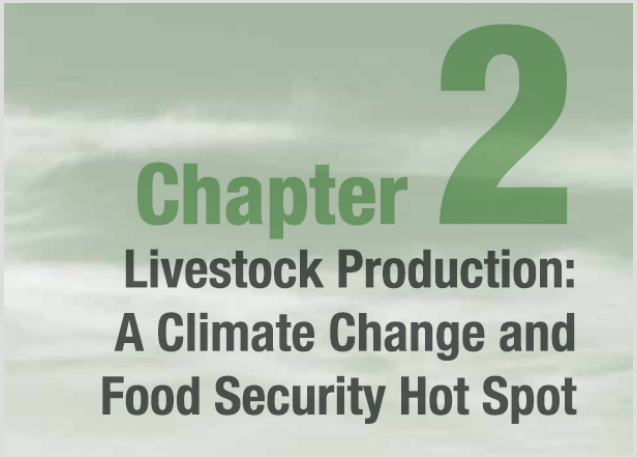


http://www.fao.org/nr/sustainability/sustainability-assessments-safa/en/

Policies supporting agriculture and food systems which protect the 'actors without a voice'

Visions for the future…

- ‘The need for a new agricultural paradigm’
- ‘Sustainability requires a new definition of the terms productivity and growth’



Research agenda

Stilmant et al. 2014 (here): Definition of a global research program for organic farming in Walloon area for 2015-2020 horizon

- 'Robustness'
- 'Nutritive value of alternative feed'
- 'Adapting to climate change'
- 'Principles for system design'
- 'Valuing interactions among systems components'
- 'Extension services ... '

Local context specific research

Long-term ...

Animal (2014), 8:8, pp 1382–1393 © The Animal Consortium 2014
doi:10.1017/S1751731114001281

animal

Forty research issues for the redesign of animal production systems in the 21st century

B. Dumont[1†], E. González-García[2], M. Thomas[3], L. Fortun-Lamothe[4], C. Ducrot[5], J. Y. Dourmad[6] and M. Tichit[7]

Thank you for your attention