

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



Allow Chickens From U.S. to Be Shipped to China for Processing and Back to U.S. for Con - Internet Explorer

http://ecowatch.com/2014/03/05/usda-chickens-shipped-china/

er Vis Favoritter Funktioner Hjælp

Søg Del Mere >>


question about assignment Hotmail - gidi_smolders48@... Foreslåede websteder

USDA to Allow Chickens From U.S. to Be Shipped to China for Processing and Back to U.S. for Consumption, Just Like Seafood

John Deike | March 5, 2014 9:03 am | Comments

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Scores of Americans are in an uproar since [Food Safety News](#) revealed the U.S. Department of Agriculture (USDA) will soon allow U.S. chickens to be sent to [China](#) for processing before being shipped back to the states for human consumption.



Taskbar icons: File Explorer, Internet Explorer, Outlook, Word, PowerPoint, Skype, PDF Reader, Photoshop

Reliance on antibiotics

- ... **1928: life saving**
- ... **1951: systematic use**
- ... **and what now ...?**



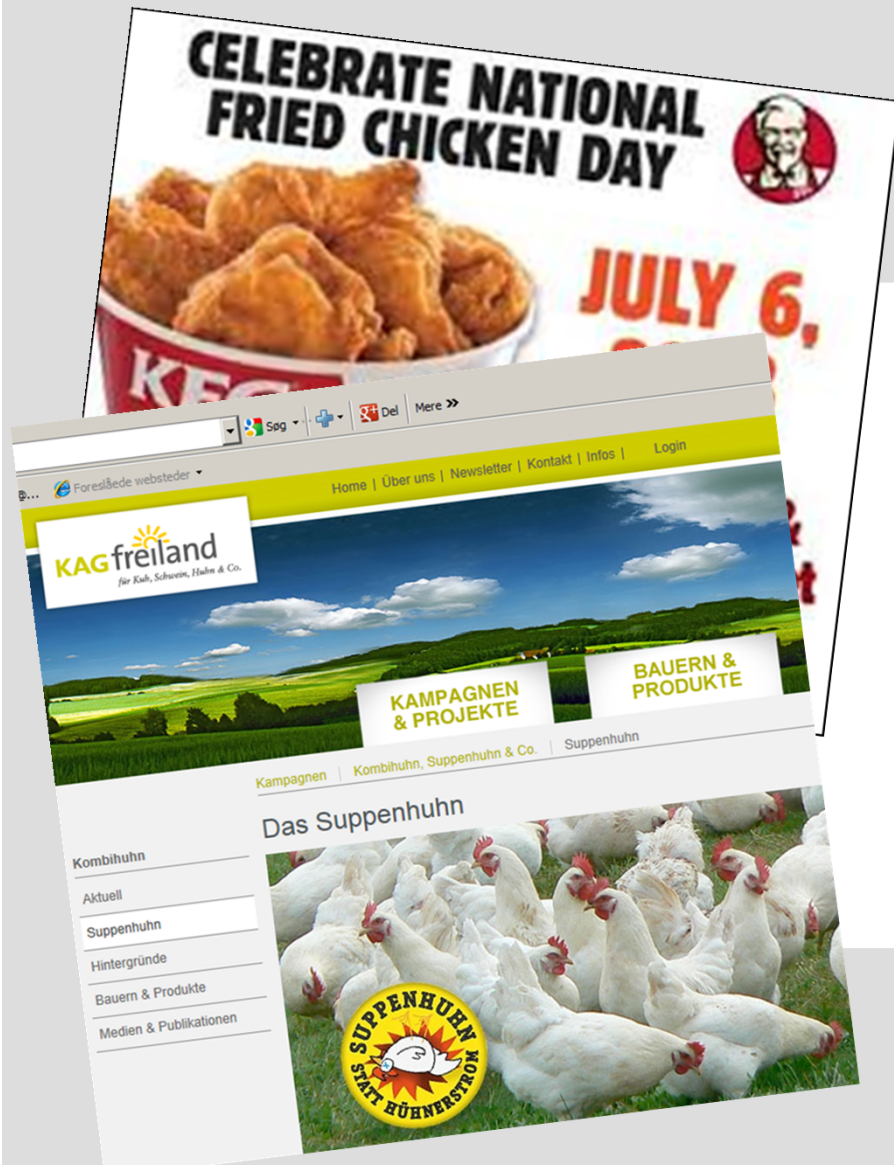
Reliance on few 'designed breeds'

- 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 ...



TASTE THE WASTE

Warum schmeißen wir unser Essen auf den Müll?



Reliance on an industrial model



'Shared suffering'

**Organic resilient
animal farming systems
to meet future livestock
production challenges**





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

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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'



From 'livestock production'

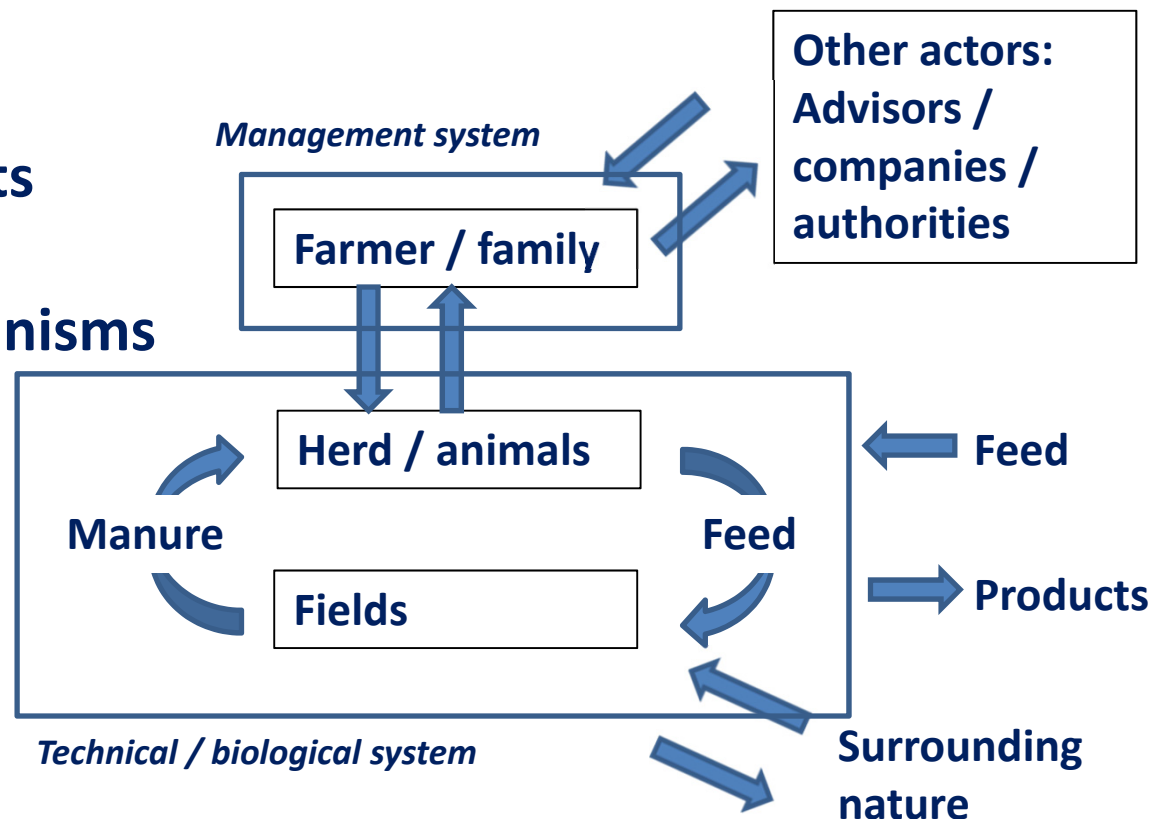


To 'animal farming systems'

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 & resources**



Organic resilient

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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.

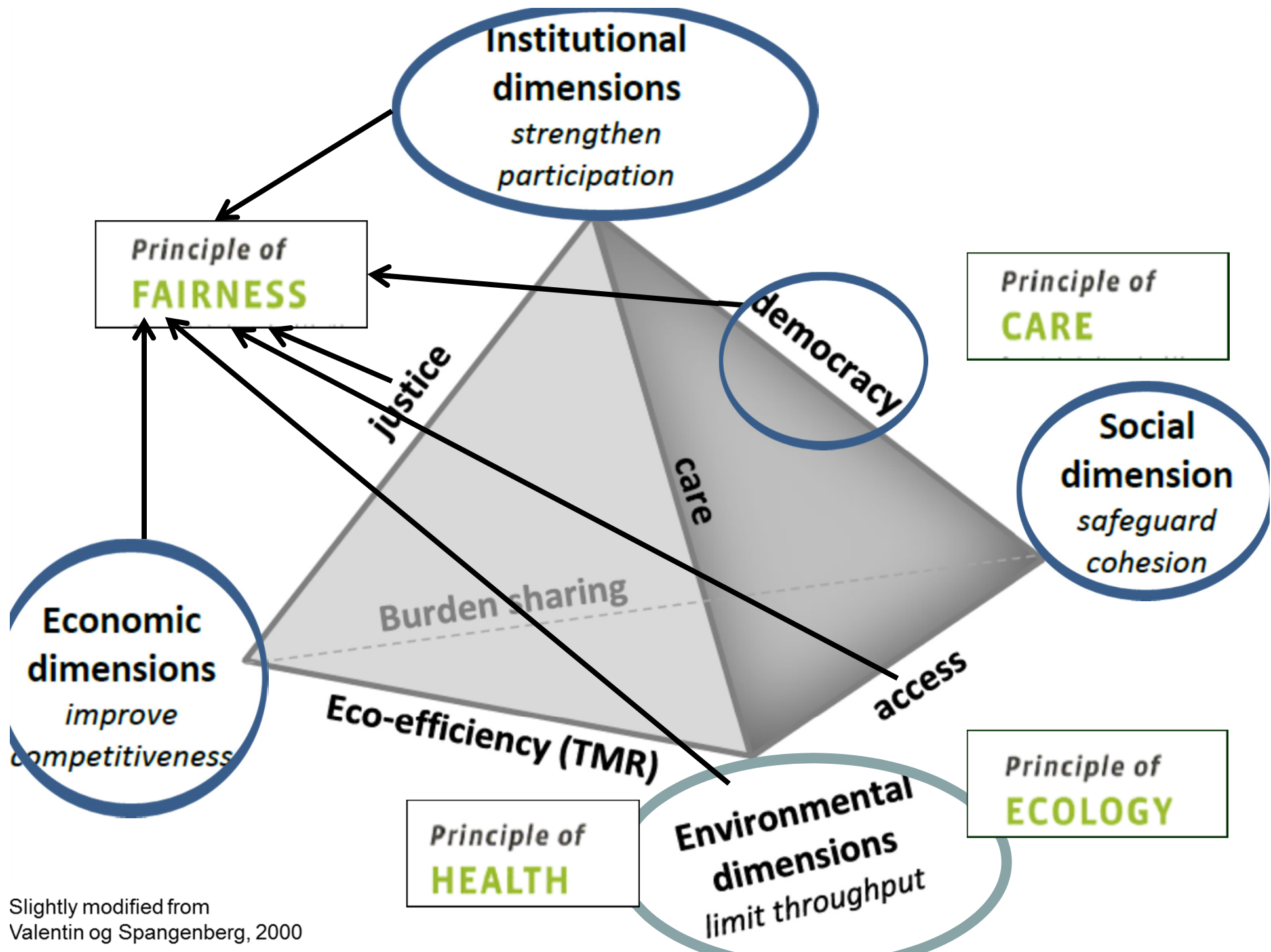
Principle of **FAIRNESS**

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

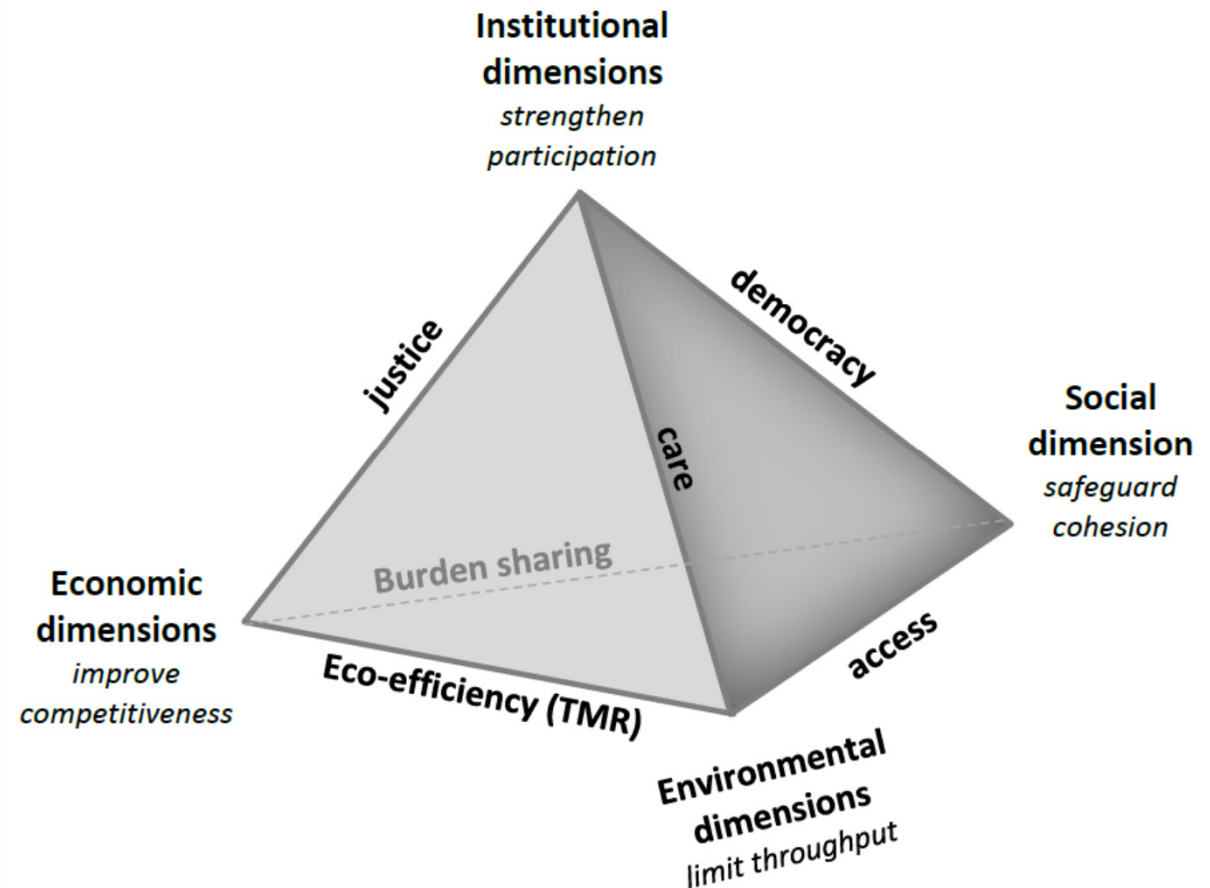
Principle of
CARE

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

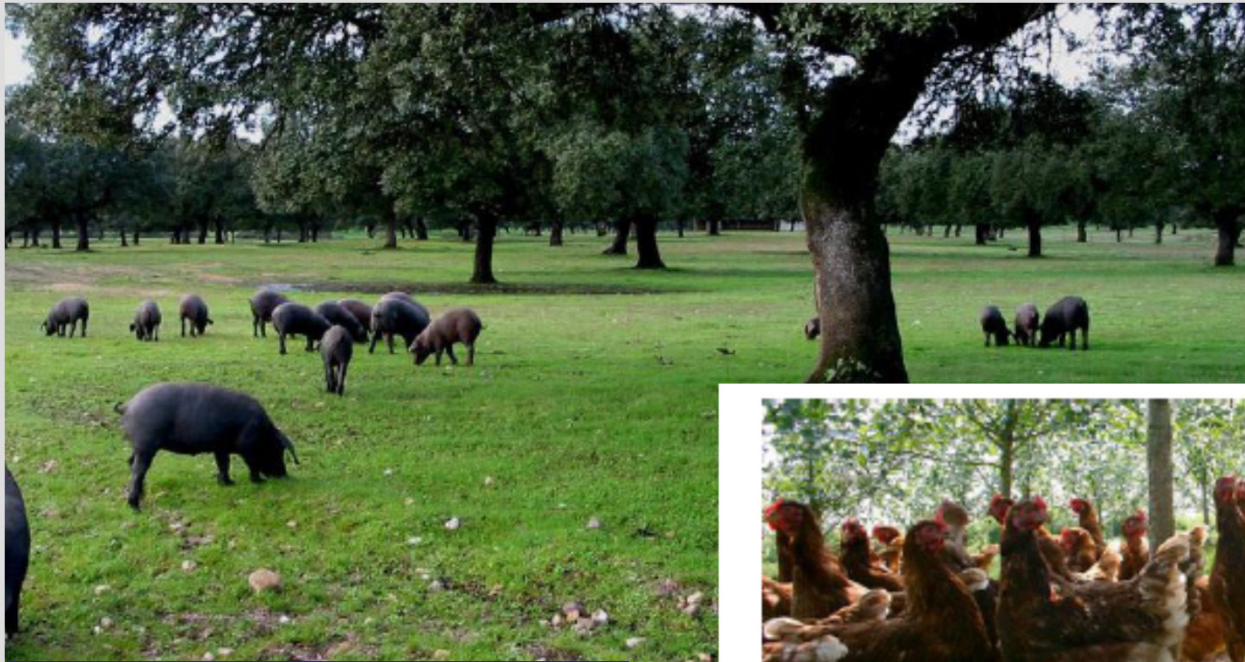


A photograph of a man in a grey polo shirt with a crest on the chest, looking at a plant in a lush tropical garden. The garden is filled with various green plants, including banana trees and large-leafed plants. The man is holding a small plant in his hands. The background shows a stone wall and more vegetation.

**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



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

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.

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



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

Naturpleje

- Naturpleje
- Kæmpe bjørneklo
- Bekæmpelse af Bjørneklo
- Får
- Klitfår
- Hyrdehund
- Kødkvæg

Der er mange grønne arealer i Ballerup Kommune bl.a. overdrev, skrænter og vådområder.

For at bevare disse områder i en attraktiv tilstand skal de naturplejes – ellers springer de på et tidspunkt i skov eller bliver dækket af kæmpe bjørneklo.

Mange af disse arealer indgår i en afgræsnings-aftale imellem Ballerup kommune og Fonden Grantoftegaard.

Afgræsning betyder, at plantevæksten holdes lav, hvilket bl.a. er til gavn for mange blomster og fugle.

Grantoftegaard afgræsser med både får og kvæg.

Fårene græsser tæt og benyttes fortrinsvis på de mere tørre arealer, mens kvæget afgræsser på de mere våde arealer, helt ud til vandlinien.

Derfor får bl.a. vadefugle, særligt gode vilkår.

Hent materiale om dyr, mark, økologi m.m. [her](#)



'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

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¹INRA, UMR 1248 AGIR, F-31320 Castanet-Tolosan, France; ²Institute of Biological, Environmental and Rural Science, Aberystwyth University, Aberystwyth, SY23 3EE, UK; ³INRA, Agrocampus, UMR 1069 SAS, F-35042 Rennes, France



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**
- **Addressing 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



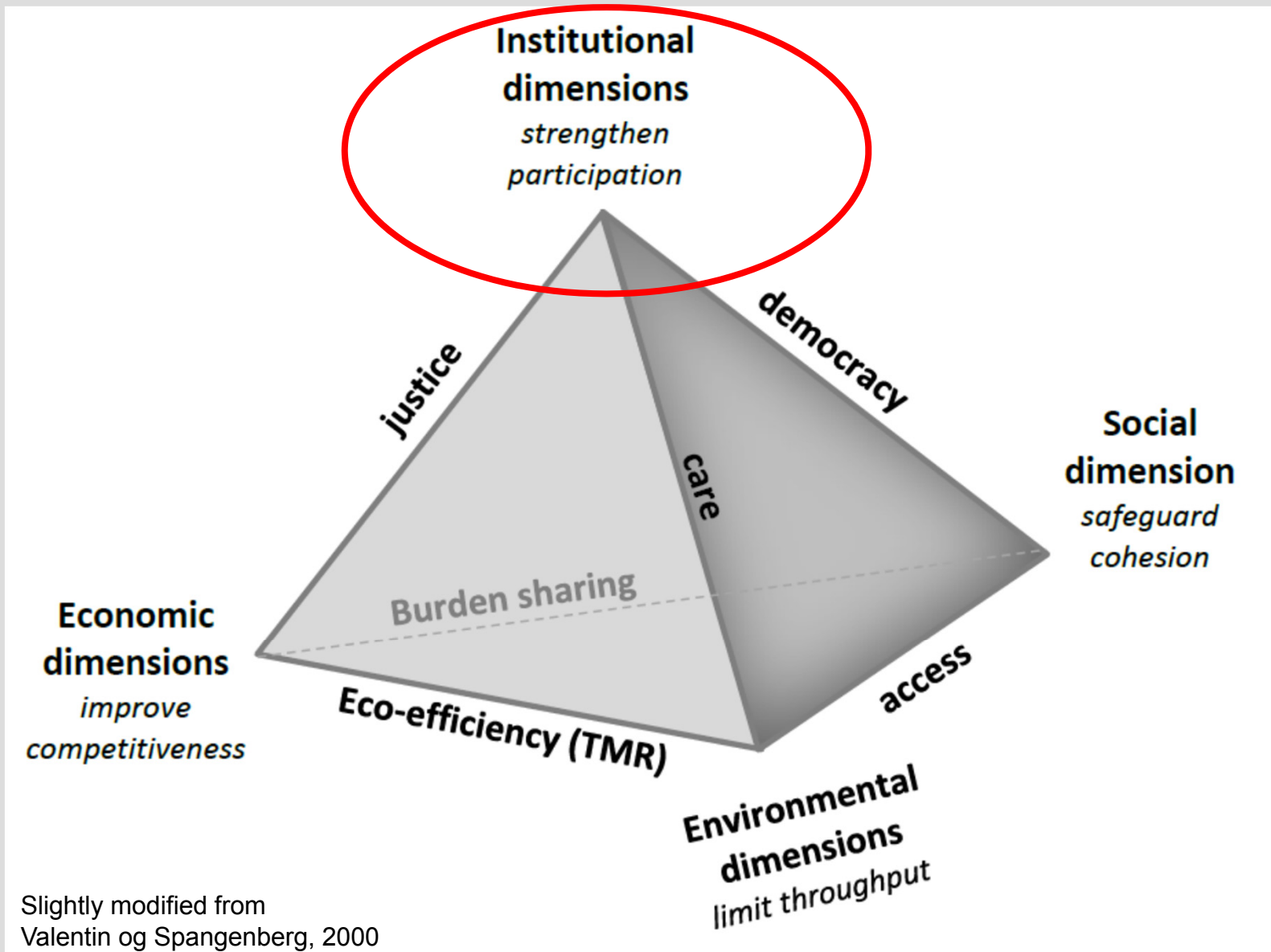
The power and potential of farmer groups for exchange & development

Complex integrated animal farming systems requires complex knowledge

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



Addressing governance



Sustainability Assessment on-line assessment tool

The image shows a screenshot of a web browser displaying the 'Sustainability Pathways' website. A large, semi-transparent diagram of the Sustainability Assessment of Food and Agriculture (SAFA) framework is overlaid on the page. The diagram is a circular radar chart with four main quadrants: **GOVERNANCE** (top-left, light blue), **ENVIRONMENT** (top-right, light green), **ECONOMY** (bottom-right, light pink), and **SOCIAL** (bottom-left, light orange). Each quadrant contains several sub-indicators. The **GOVERNANCE** quadrant includes: ACCOUNTABILITY, CORPORATE ETHICS, CULTURAL DEVELOPMENT, HUMAN HEALTH & SAFETY, EQUITY, LABOUR RIGHTS, FAIR TRADING PRACTICES, and DECENT LIVELIHOOD. The **ENVIRONMENT** quadrant includes: ATMOSPHERE, WATER, LAND, MATERIALS & ENERGY, BIODIVERSITY, and ANIMAL WELFARE. The **ECONOMY** quadrant includes: INVESTMENT, VULNERABILITY, and PRODUCT QUALITY AND INFORMATION. The **SOCIAL** quadrant includes: LOCAL ECONOMY. The word 'GOVERNANCE' is circled in red. The website background shows a landscape image and a section titled 'and Agriculture systems (SAFA)'. A navigation menu on the left includes: Home, Greening the Economy with Agriculture (GEA), Sustainability assessments (SAFA), SAFA Tool, SAFA Small APP, and FAQ.

<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'



Chapter 2

Livestock Production: A Climate Change and Food Security Hot Spot

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'** Local context
specific research
- **'Principles for system design'** Long-term ...
- **'Valuing interactions among systems
components'**
- **'Extension services ...'**

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



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

B. Dumont^{1†}, E. González-García², M. Thomas³, L. Fortun-Lamothe⁴, C. Ducrot⁵,
J. Y. Dourmad⁶ and M. Tichit⁷



Thank you for your attention