

## Session 30

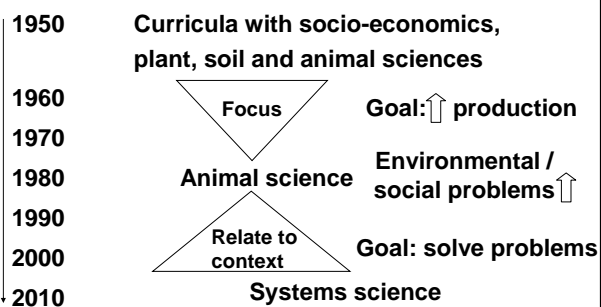
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## How to educate animal production system specialists?

C.H.A.M. (Karen) Eilers



### Why 'systems' specialists are needed:

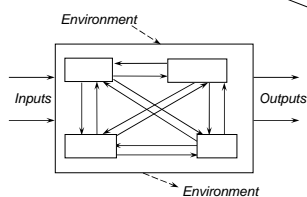


### Educational program

- Systems science
- Methods and context
- Future scenario's
- Application of knowledge: thesis

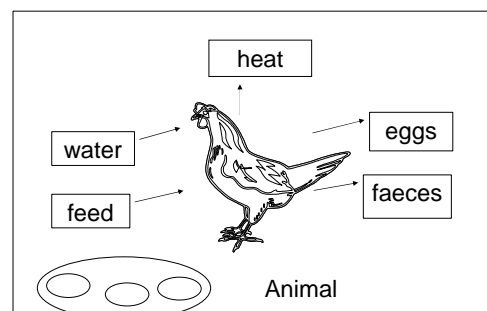
### Systems science: language

A system is an entity, which maintains its existence through the mutual interaction of its parts

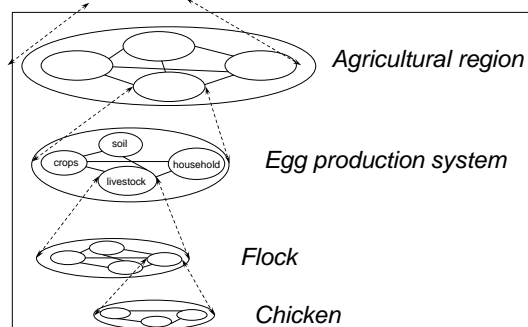


Ludwig von Bertalanffy

### Systems science: language



### Systems science: language



### Systems science: Approach

#### Step 1

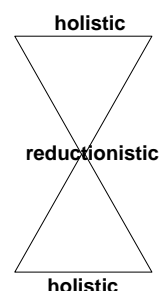
- Problem definition
- Delineation of system
- Context

#### Step 2

- In-depth analysis of components and relationships

#### Step 3

- Interpretation of results related to context



### Systems Approach in Animal Sciences (distance learning)

#### Students learn:

- Basics of systems science:
  - Systems language
  - Systems approach
- [www.aps.wur.nl/SAAS](http://www.aps.wur.nl/SAAS)

### Methods

#### Sub-questions ask for different methods:

- Surveys
- Simulation and optimization
- Participatory research
- On-farm and experimental research

#### Relate to context and conclude



### Contexts: social/ ecological/ economic

#### Students need to be able to:

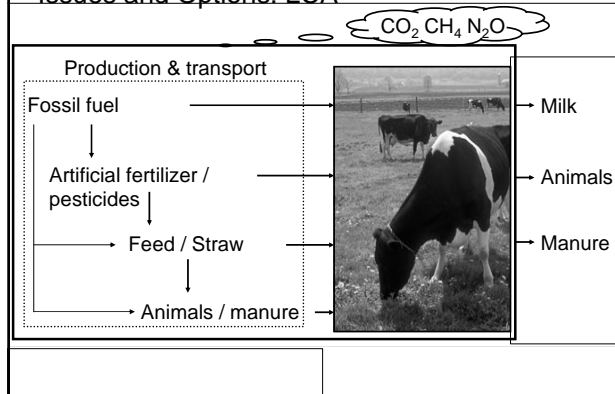
- Communicate with specialists in different fields
- Analyze complex problems in different fields
- Social: Perception of mega farms in Netherlands
- Ecological:  $\text{NH}_3$  related to egg production
- Economic: Costs of animal welfare measurements

### Sustainable Development of Animal Systems: I&O

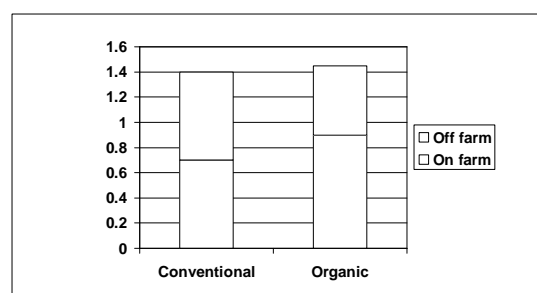
#### Students learn:

- the process from problem identification to solutions
- useful techniques/methods for different contexts:
  - various **environmental** impact assessment tools
  - various **social** aspects assessment tools
  - **economic** assessment of innovations
- To interpret technical, economic, ecological and social consequences

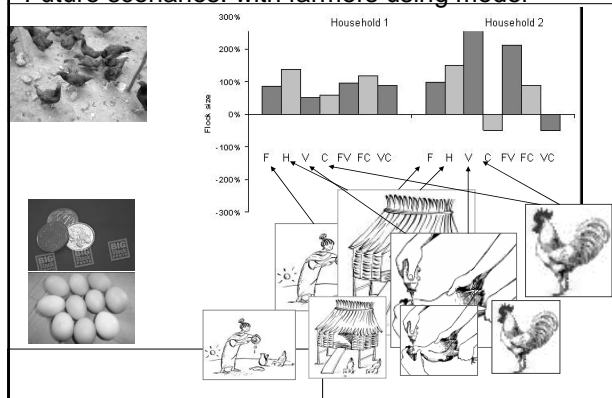
### Issues and Options: LCA



### Climate change: kg $\text{CO}_2$ -eq / kg milk



### Future scenarios: with farmers using model

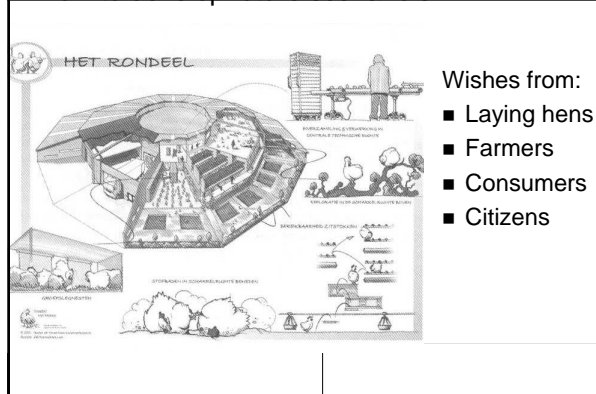


### Future livestock systems

#### Students learn:

- To design future scenario's of livestock farming systems
- To relate livestock system development to
  - Drivers for development
  - Values and functions of animal (systems)
  - Resource use
  - Environmental issues
- To critically judge and discuss livestock systems development.

### How to develop future scenario's?



### Apply knowledge in APS thesis

Pig and poultry production systems

Regional level: societal context



North Brabant,  
Netherlands

Marloes van Schaik

Scale of farms increases due to economic driving forces

Societal protests due to negative image: fear for consequences



## Theses in Animal Production Systems

Pig production systems

Regional level: societal context

Papua,  
Indonesia



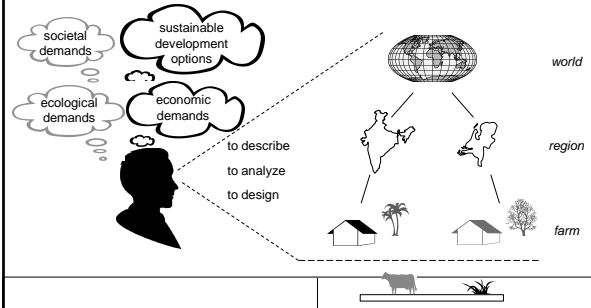
Deny Iyai



Free-range pigs: against the law  
Traditional production system  
50% free-range pigs kept for cultural reasons

## Capabilities of an APS-specialist:

- Explore sustainable development options for a variety of animal production systems worldwide



## Questions?

Thank you for your attention

[www.aps.wur.nl](http://www.aps.wur.nl)



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