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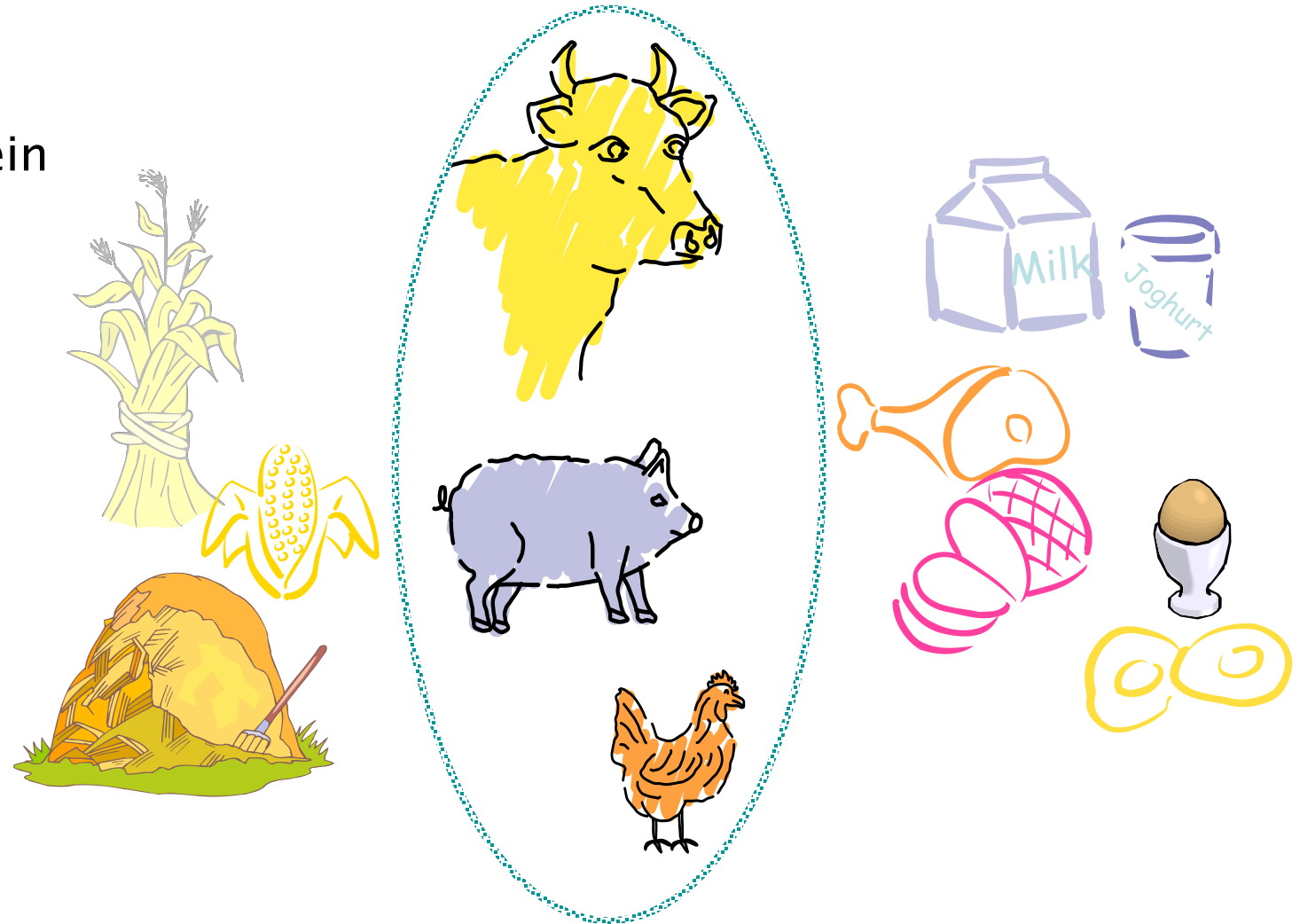
## Livestock in diversified agricultural systems – impulse statement

M. Rodehutschord

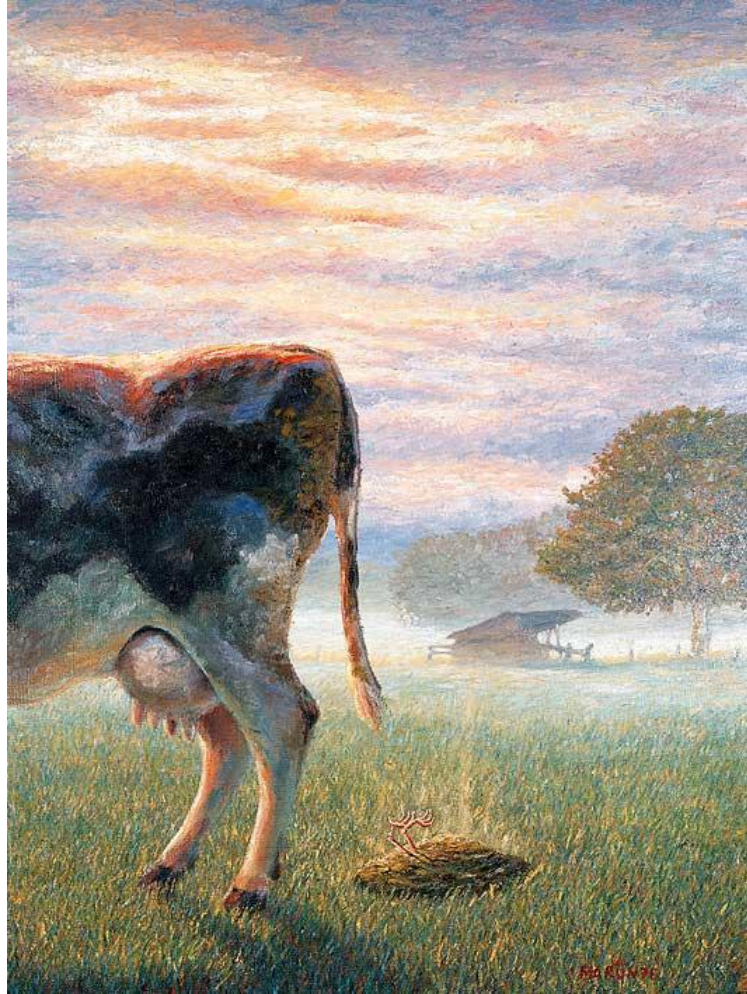
Institute of Animal Science



- Global demand for (animal) protein
- Competition for plant biomass: food vs. feed
- Greenhouse gas emission
- Nutrient cycling



# Incomplete transformation: Excretion

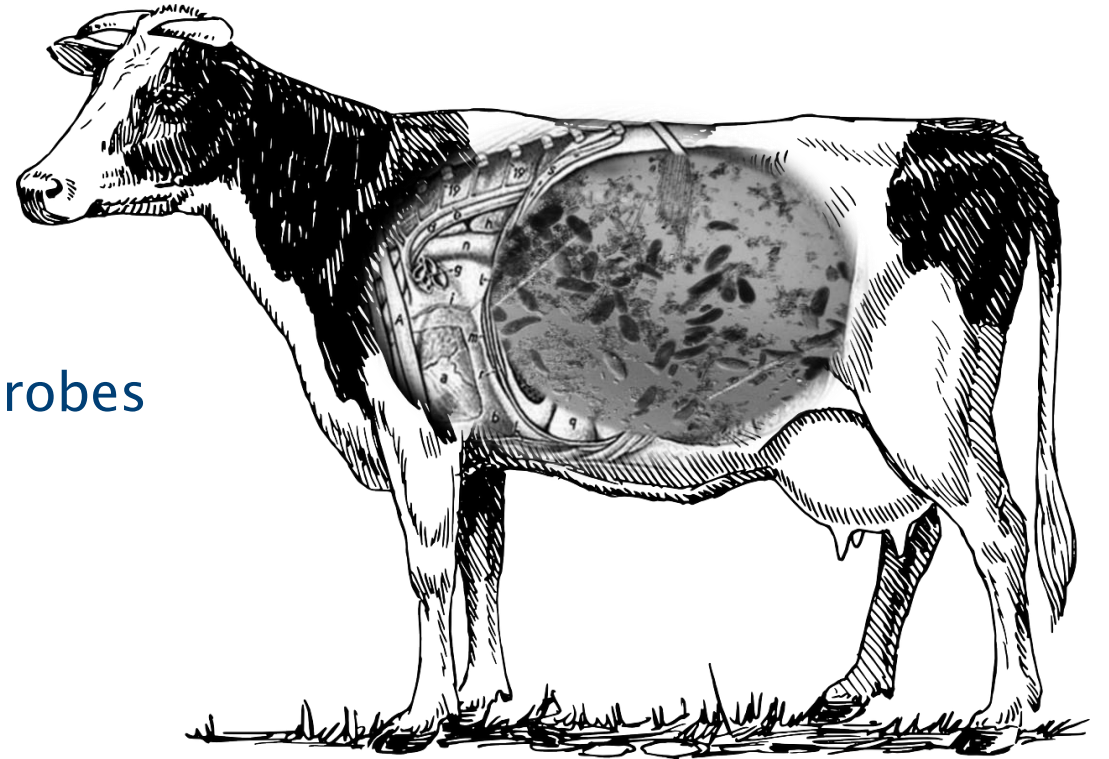




# Different perspectives

- Ruminants (bovines, goats, sheep)

more than half of the  
feed is digested by microbes



- Non-ruminants (pigs, poultry)

digestion process similar to humans

# Different perspectives

- Ruminants (bovines, goats, sheep)

FAOstat:

*67 % of 'agricultural land' is 'land under permanent meadows and pastures'*

transformation to edible protein and energy only by the help of microbes

- Non-ruminants (pigs, poultry)

by-products of food and energy sector: 11 Mio. t/y (Germany)  
(bran, oilseed press cake, sugar beet pulp, etc.)

# Different perspectives

- Ruminants (bovines, goats, sheep)

make them independent of concentrate feed

- Non-ruminants (pigs, poultry)

let them transform inedible by-products of the food sector to edible protein and energy

Implications for animal performance, total production, and economy

# Non-nutritional aspects

- Animal breeding (*Bennewitz et al. 2021*)
  - Diversified and re-evaluated breeding goals:  
e.g. performance vs. health/disease resistance/longevity
- Animal welfare and behaviour: housing and management conditions

# Role of Animal Science

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- Development and improvement of methods
- Understanding of the principle biological responses

To be utilised depending on specific framework conditions and production preferences





# Crude protein (CP) utilisation efficiency



2.6 kg feed → 1 kg body weight  
 18% CP → 16% CP



1.6 kg feed → 1 kg body weight  
 20% CP → 18% CP



2.0 kg feed → 1 kg egg  
 170 g CP/kg → 120 g CP/kg

Efficiency:



Excretion of N-containing compounds, mainly via the urine

► Part of this is inevitable excretion, but not all