Applying energy balance modelling to assess the limits of efficiency of broiler chicken

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Background: Assessing environmental sustainability of broiler production

Predicting the environmental impacts of chicken systems in the United Kingdom through a life cycle assessment: Broiler production systems

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Research Article

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Effects of dietary protease on nitrogen emissions from broiler production: a holistic comparison using Life Cycle Assessment†

Ilkka Leinonen[a*] and Adrian G Williams[b]

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Comparing the environmental impacts of alternative protein crops in poultry diets: The consequences of uncertainty

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GENETICS AND GENOMICS

Potential environmental benefits of prospective genetic changes in broiler traits

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ENVIRONMENT, WELL-BEING, AND BEHAVIOR

The effects of welfare-enhancing system changes on the environmental impacts of broiler and egg production

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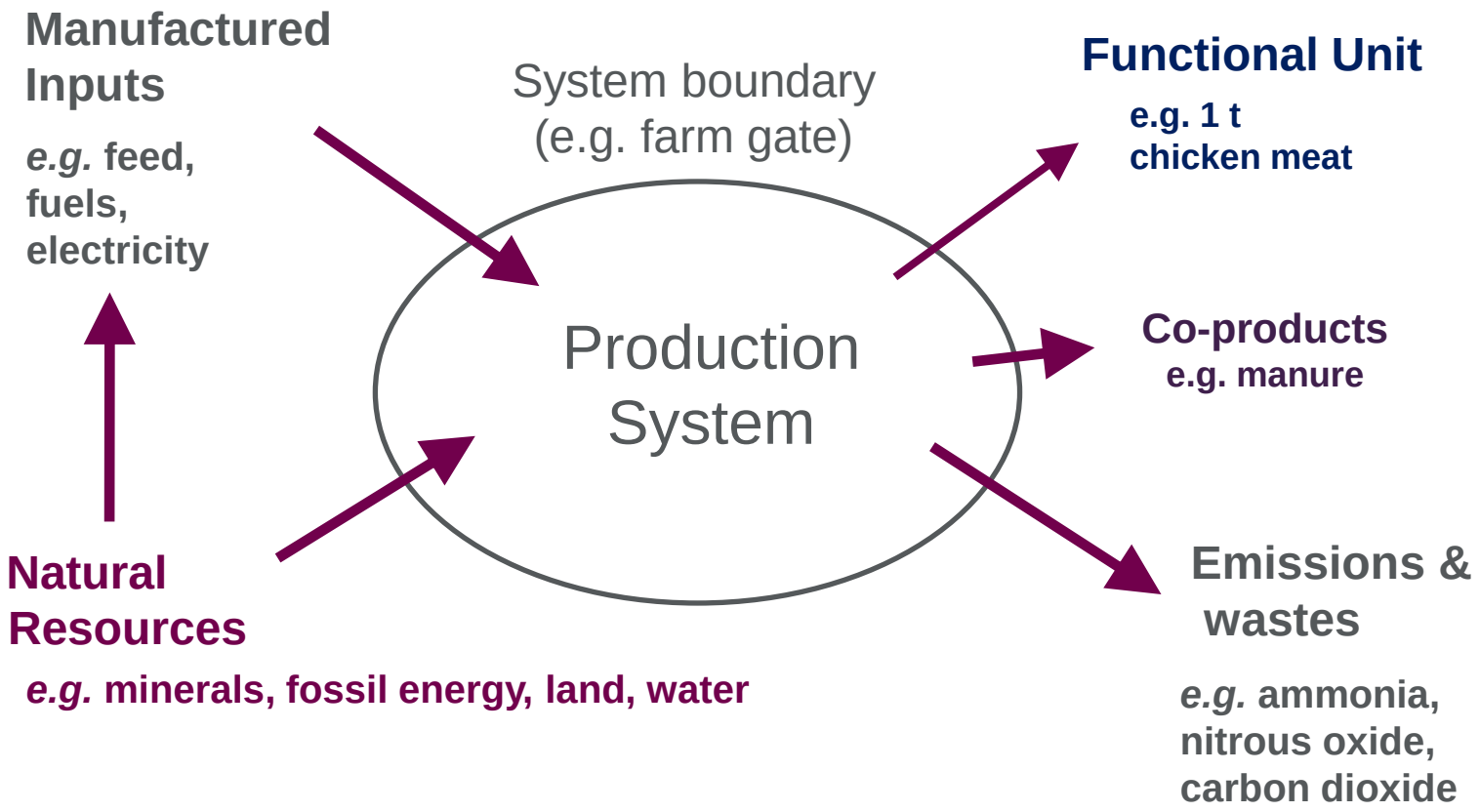
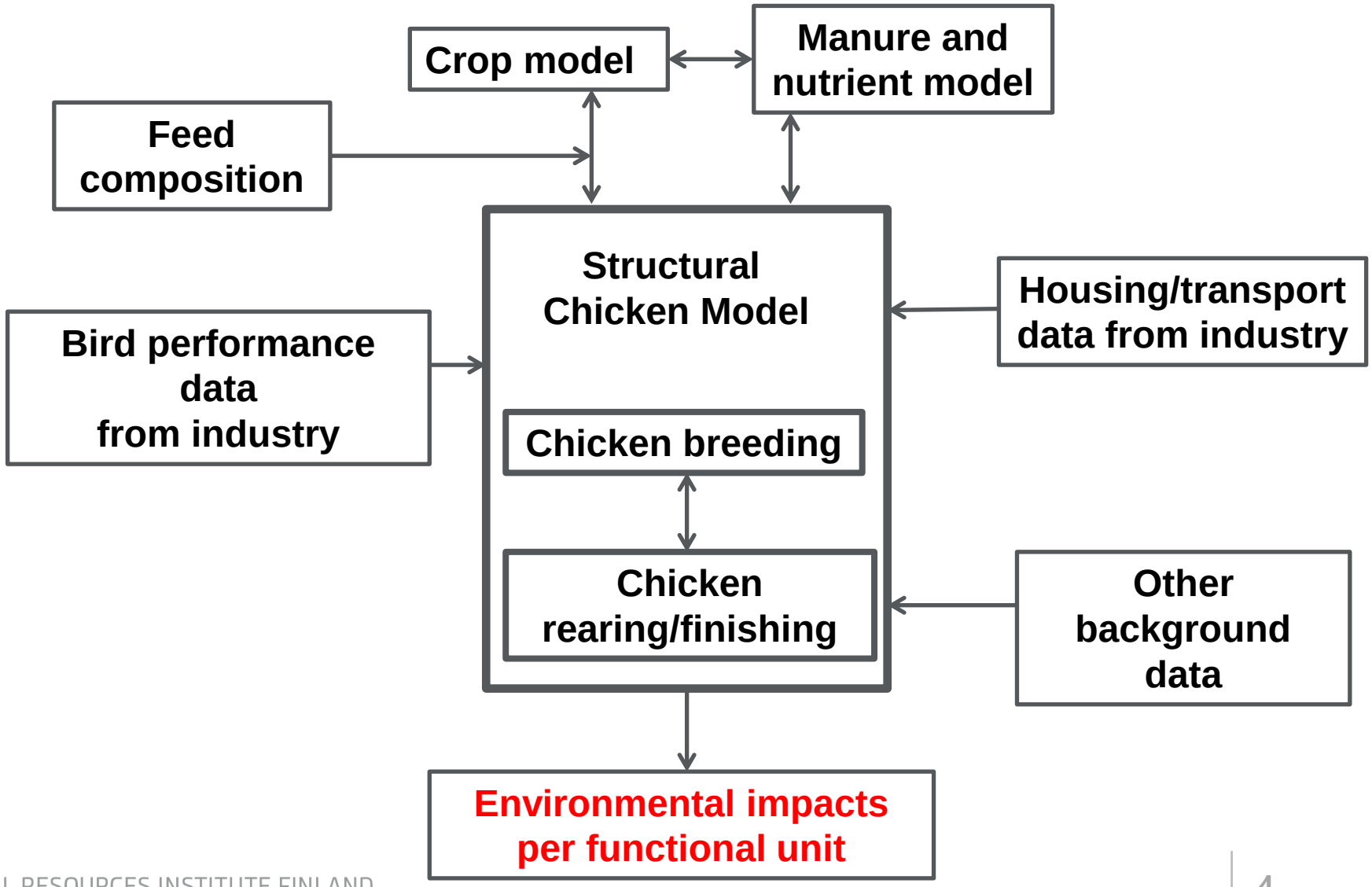
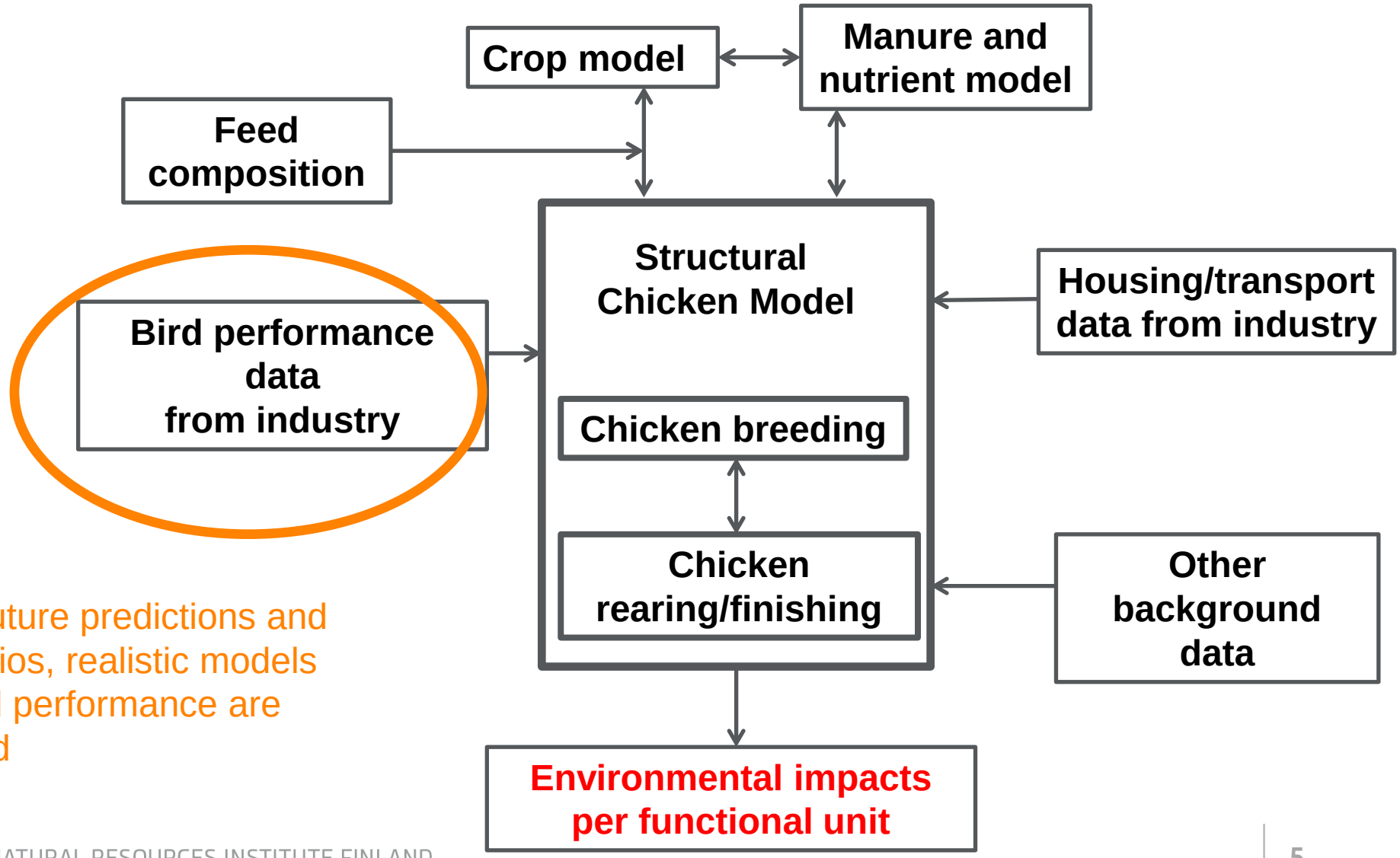
Environmental life cycle assessment (LCA)



Application of systems models in LCA



Using systems models for predictions



- For future predictions and scenarios, realistic models for bird performance are needed

Continuos trend of increasing efficiency

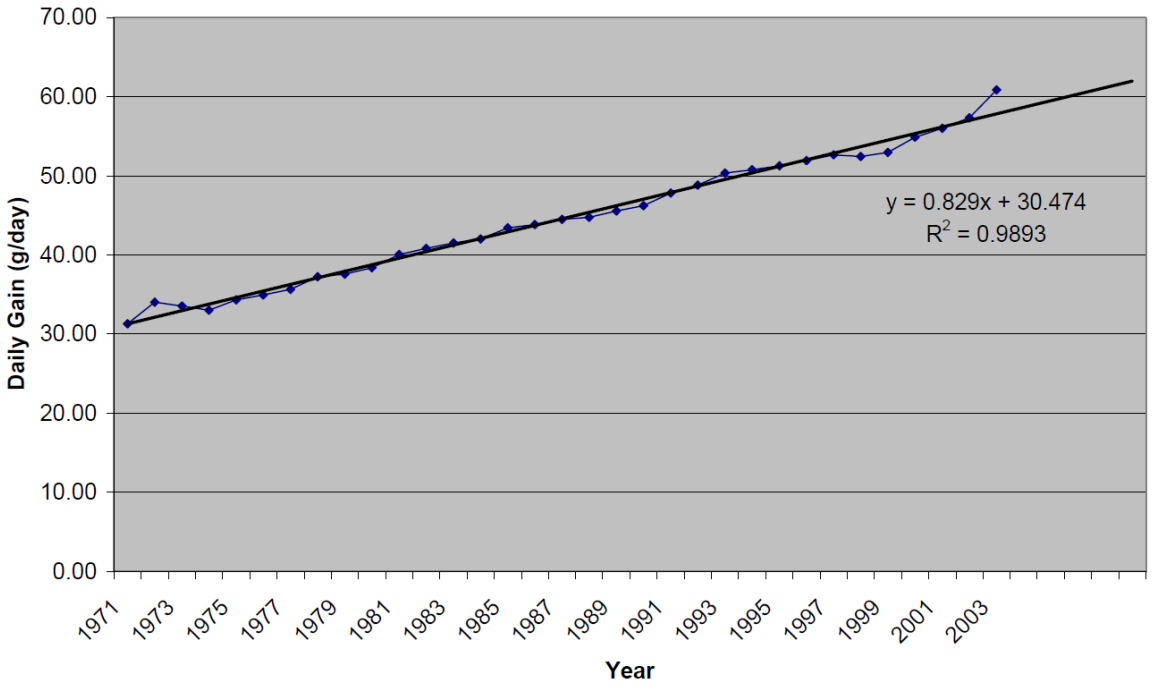


Fig. 9 Long term trend broiler daily gain (g/day) from UK industry data set (NFU Broiler Bulletins)

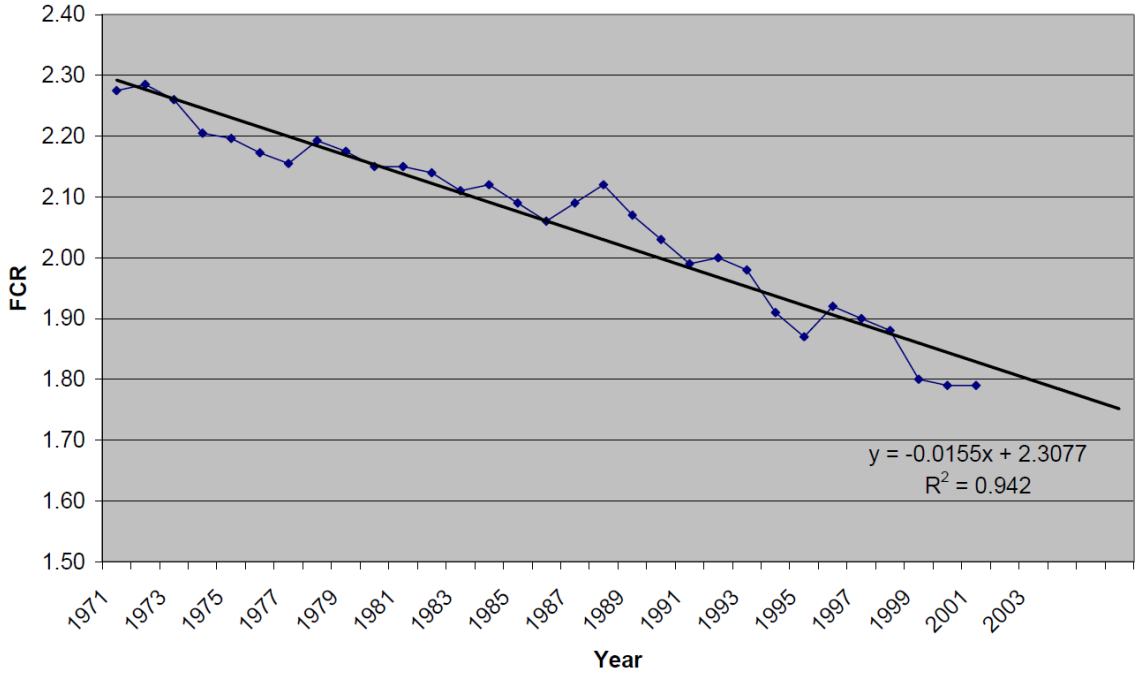


Fig. 10 Long term trend in FCR (kg feed per kg liveweight) from UK industry data set (NFU Broiler Bulletins)

Source: Laughlin K (2007) The evolution of genetics, breeding and production. Harper Adams University College, Newport, Shropshire

Energy balance model for chicken feed efficiency needed

Agron. Sustain. Dev. (2016) 36:66
DOI 10.1007/s13593-016-0398-2

REVIEW ARTICLE

Breeding for efficiency in the broiler chicken: A review

Craig W. Tallentire[1] · Ilkka Leinonen[1] · Ilias Kyriazakis[1]

SCIENTIFIC REPORTS

Correction: Publisher Correction

OPEN

Artificial selection for improved energy efficiency is reaching its limits in broiler chickens

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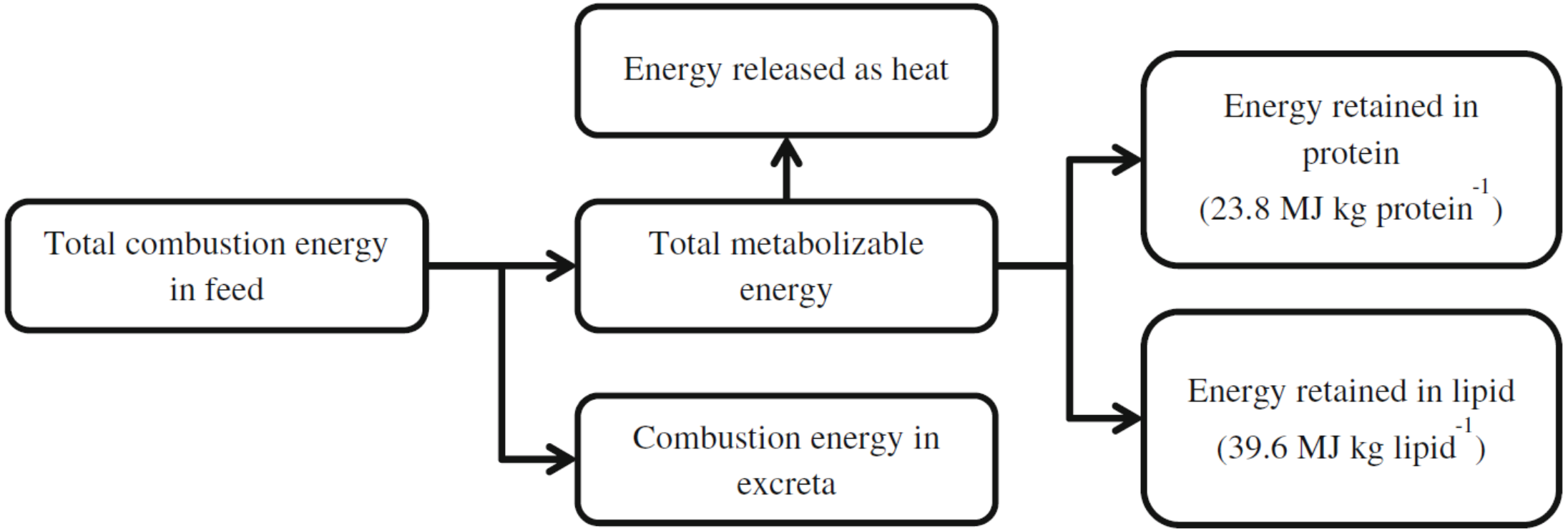
C. W. Tallentire[1], I. Leinonen[1,2] & I. Kyriazakis[1]

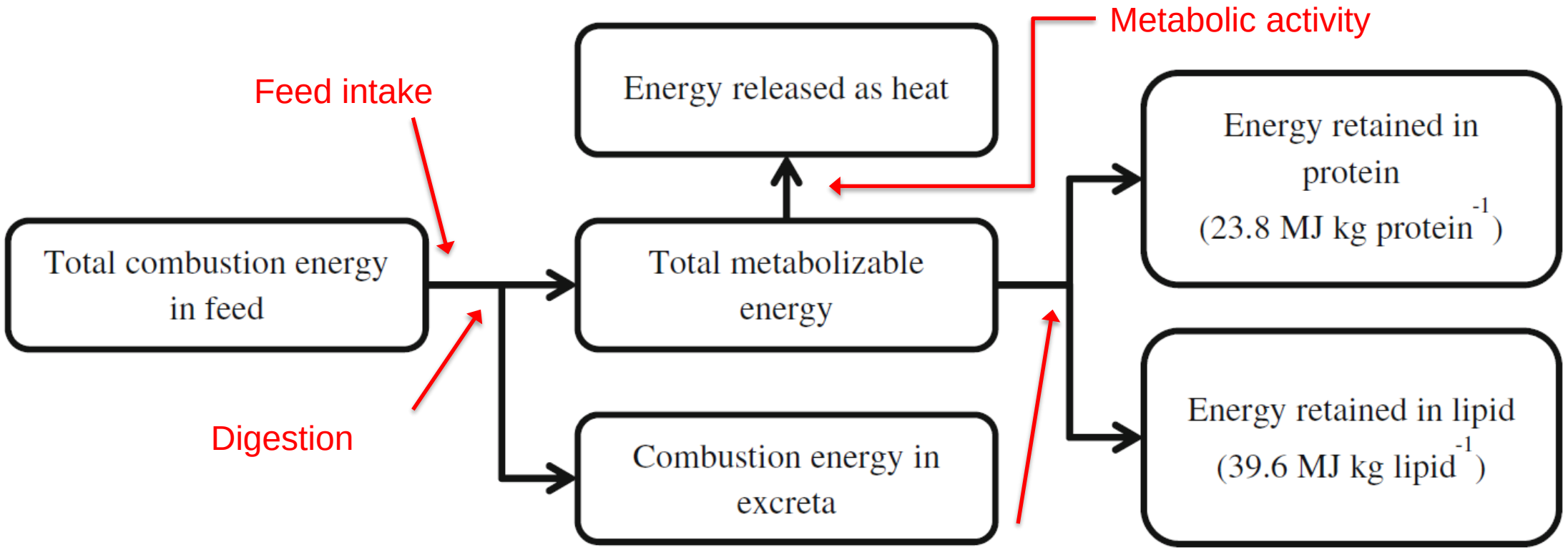
Modern broiler chickens are a major animal husbandry success story, both in terms of efficient resource utilisation and environmental sustainability. However, continuing artificial selection for both efficiency

Broiler energy balance model



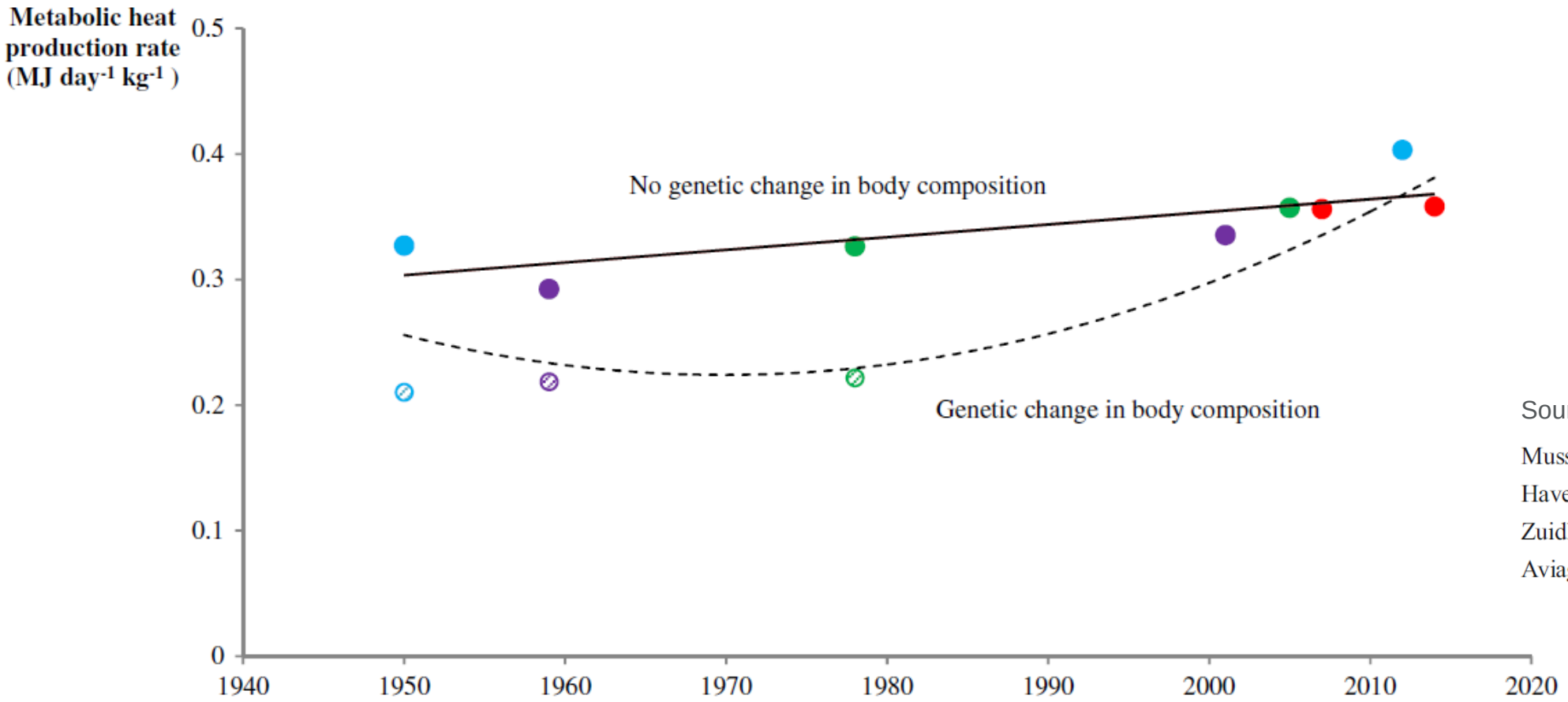
Tallentire et al. 2016. Agronomy for Sustainable Development 36: 66.

Broiler energy balance model



Tallentire et al. 2016. Agronomy for Sustainable Development 36: 66.

Trend of metabolic activity



Sources of data:

Mussini (2012)

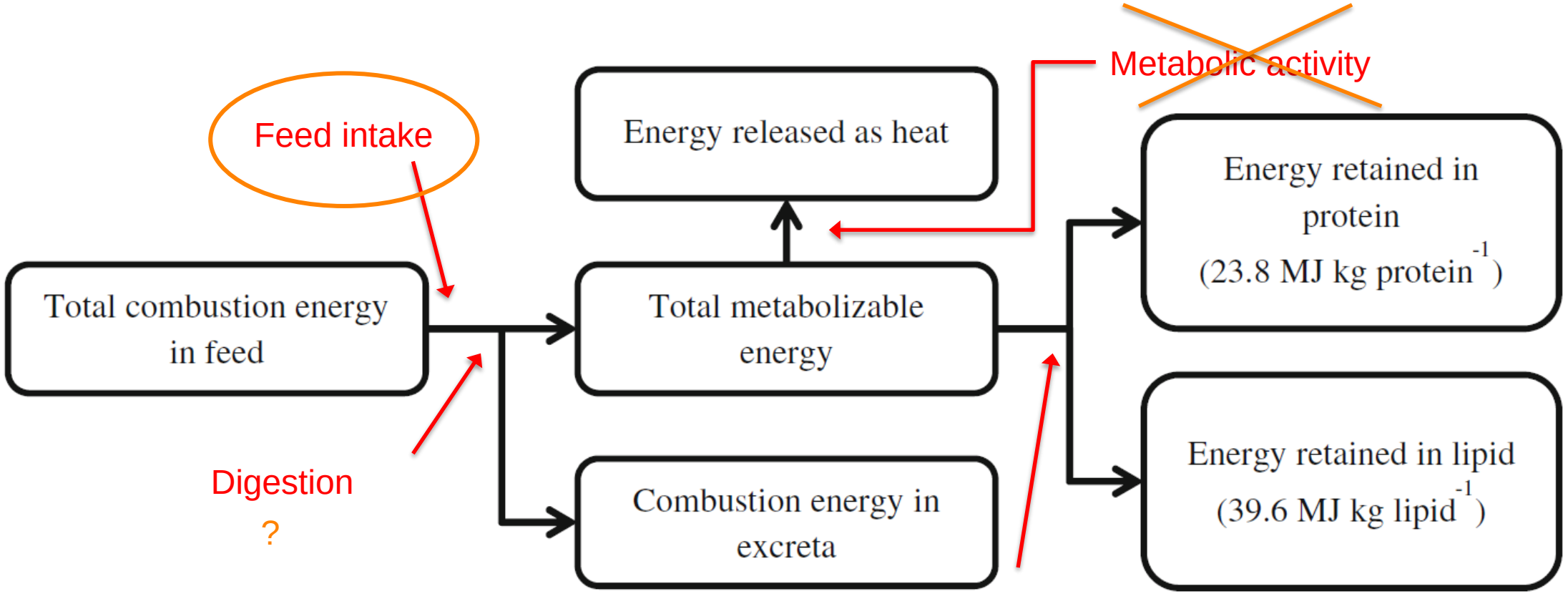
Havenstein et al. (2003a)

Zuidhof et al. (2014)

Aviagen (2007a, b and 2014a, b)

Tallentire et al. 2016. Agronomy for Sustainable Development 36: 66.

What are the key processes of increased efficiency? - what are their limits?



Tallentire et al. 2016. Agronomy for Sustainable Development 36: 66.