Future Livestock Farming Systems

ATF Seminar Responsible Livestock Systems

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alistair.stott@sruc.ac.uk

Leading the way in Agriculture and Rural Research, Education and Consulting
‘Cool’ Dairy Farm of the Future?

Not if we embrace trade-offs!

A. Stott, Farmers’ Club Charitable Trust Sabbatical, Florida, 1987
Plan of talk

• Introduction to SRUC
• What is the future for agriculture?
• What is the response?
• Are trade-offs inevitable?
• How to reconcile them?
• Achieving farmer uptake
• Conclusions
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Crop Clinic News
17 Oct. Winter wheat/late barley

Essential Reading
Farm Management Handbook

Course Subject Areas
Activity Tourism, Animal Care

International Conference
Did you miss last month’s Carbon
SRUC systems research centres

Map 2:
Farm Types by Parish
(Main and minor holdings)
- Crops
- General Cropping
- Horticulture
- Specialist Pigs
- Specialist Poultry
- Dairy
- Cattle & Sheep (LFA)
- Cattle & Sheep (Lowland)
- Mixed
- Other

- Epidemiology Research Unit
- Craibstone (mixed, organic)
- Kirkton (hill, upland, trees, sheep, tourism)
- Carbon Management Centre
- Bush estate mixed, plus Beef and Sheep Research Centre
- Crichton (Dairy Research Centre)
The ‘Perfect Storm’ Scenario

Future of Agriculture

Energy

Climate Change

Food
Increased demand 50% by 2030 (FAO)

Water
Increased demand 30% by 2030 (IFPRI)
‘Foresight’ Response

Sustainable Intensification*

Trade-off inevitable?

Conflicts between animal welfare and productivity

- Externality ‘Social pillar’
- ‘natural’ welfare
- ‘maximal’ welfare
- ‘desired/appropriate’ welfare
- ‘minimal’ welfare
- Food Security ‘Economic pillar’

Society’s choice?


Source: CCC modelling
Notes: N = Nitrogen, AD = anaerobic digestion
Measures do not appear in exact cost-effectiveness order due to interactions between options. More details and a full measures list is available in the accompanying technical papers.
Problem 1

How to reconcile multiple outcomes?
How to reconcile multiple outcomes?

Shift perspective to input-output trade-offs
Technical Efficiency (Farrell, 1957)

![Diagram of Technical Efficiency](image)

- **Y (output)**
- **x₁ (input)**

- Points B, D, A, and E
- Science
- Distance to the frontier

SRUC
Efficiency and animal welfare

Reductions needed to become technically efficient (survey 80 farms)

Crichton Dairy Research Centre

G X E Experiment: LFC, LFS, HFC, HFS
Efficiency at Crichton Considering CO$_2$e & N

Problem 2

How to gain farmer uptake?
One solution

Take a farmer perspective on trade-offs
What about the farmer’s perspective?

ACTIVITIES
- Stocking Rate
- Mix
- Feed
- Mate
- Watch
- Treat
- Replace
- Cull
- Train
- Ventilate
- Replace
- Hygiene
- ‘Off-farm’

OBJECTIVES?
- Profit
- Welfare
- Security
- Pride etc.

RESOURCES
- Land
- Labour
- Capital
- Skill
- Facilities
- Vets
- INFORMATION etc.

CONSTRAINTS
- Scarce resources
- Law
- Prod.System
- Marketing

What about the farmer’s perspective?
Hill Sheep Systems

Extensify

- Good animal welfare
- Higher profits
- Less food production
- Environment?
- Biodiversity?

Intensify

- Better animal welfare
- Lower profits
- More food production
- Environment?
- Biodiversity?

Farmer Decision Making

Policy & Research

*Defra project AW1024

Precision Livestock Farming

Example – “Silent Herdsman”
• 200+ commercial farm users

Example – “Virtual Fencing”
Sat-nav for cattle

D.Ross, C.Umstatter SRUC,
Conclusion

• Understanding trade-offs may be the key to responsible livestock farming.

• Applied interdisciplinary research is the key to such understanding and its uptake.

• Precision livestock farming may facilitate trade-offs and uptake.
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