Welfare of dairy cows in continuously housed versus pasture-based systems.

Gareth Arnott,
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Niamh O'Connell

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‘ continuous housing

J. Dairy Sci. 97:7985–7994
http://dx.doi.org/10.3168/jds.2014-8265

Current trends in British dairy management regimens

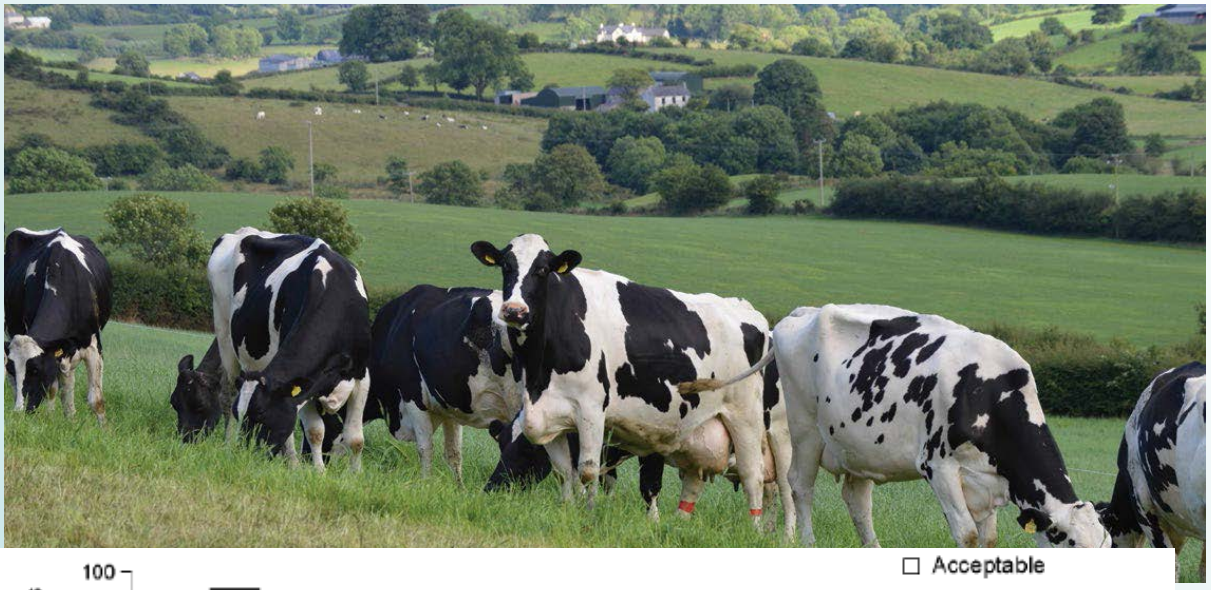
M. D. March,[1] M. J. Haskell, M. G. G. Chagunda, F. M. Langford, and D. J. Roberts
Scotland's Rural College (SRUC) Research, King's Buildings, West Mains Road, Edinburgh, EH9 3JG, United Kingdom

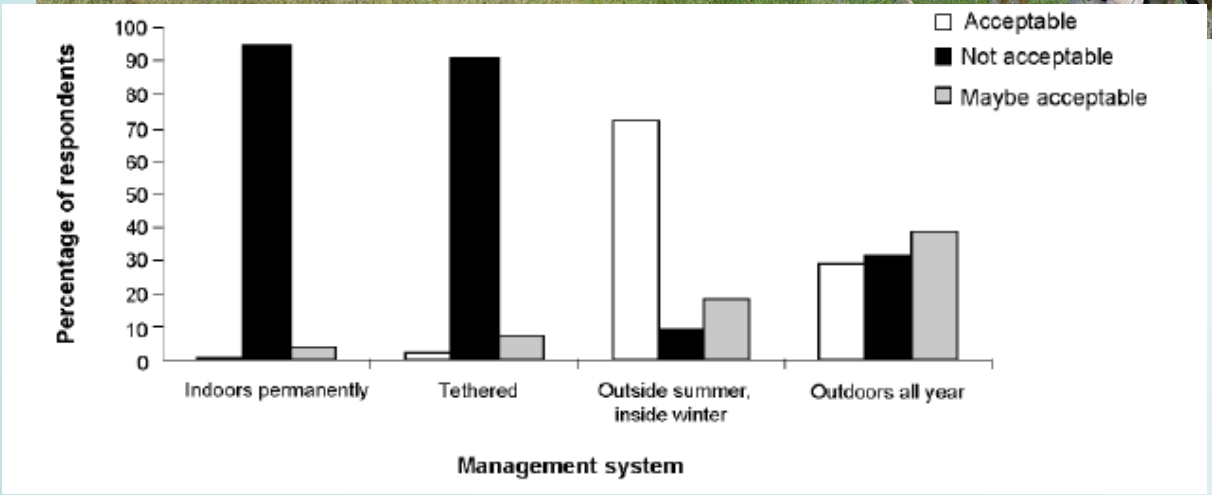
Grazing dairy cows in North-West Europe

Economic farm performance and future developments with emphasis on the Dutch situation

Reijs et al. 2013

Consumer perception





Ellis et al. 2009

Continuous housing vs. Pasture Systems: What does the science say?

- Review of global dairy science literature

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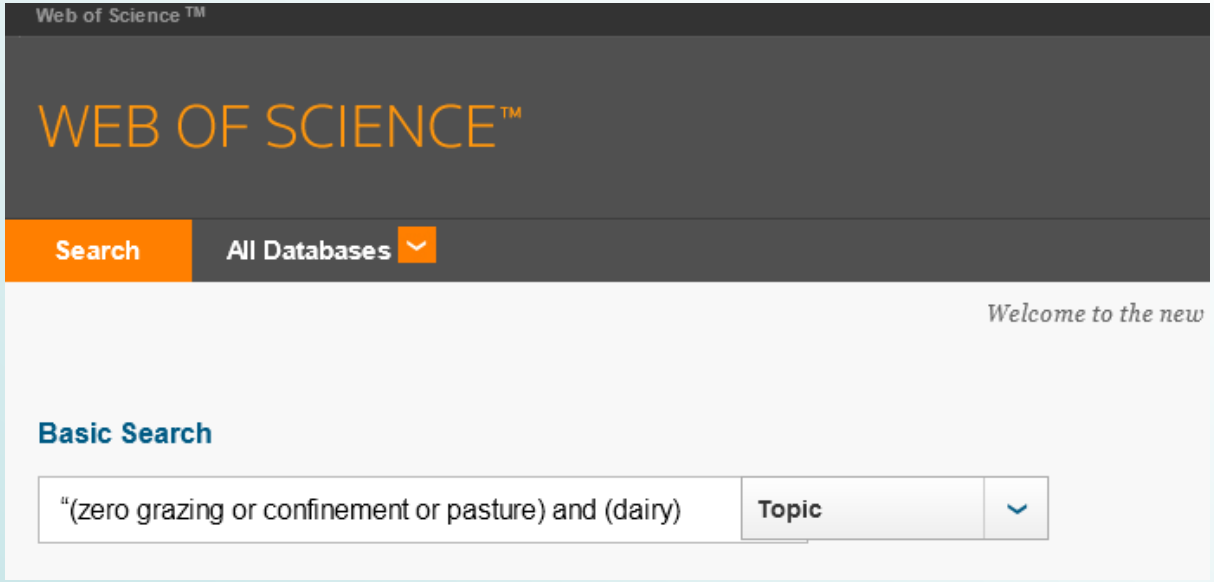
About the review

- Broad review topic: Continuous housing (confinement / zero grazing / TMR) compared to pasture based production systems.

- Aim: review and summarise existing work, prevent duplication of work, identify knowledge gaps, relate findings to NI context.

Finding the studies



- "Web of science" search term: "(zero grazing or confinement or pasture) and (dairy)"
- Yielded 5433 references to sort through
- 196 potentially relevant studies identified

Two main factors that differ

1. Feeding / Nutrition

2. Housing

Animal health and welfare: 90

- Production: 60
- Fertility: 9
- Environmental impact: 10
- Economics: 9
- (Other: 18)

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Review: welfare of dairy cows in continuously housed and pasture-based production systems

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A comparison of confinement and grazing systems for dairy cows:

What does the science say?

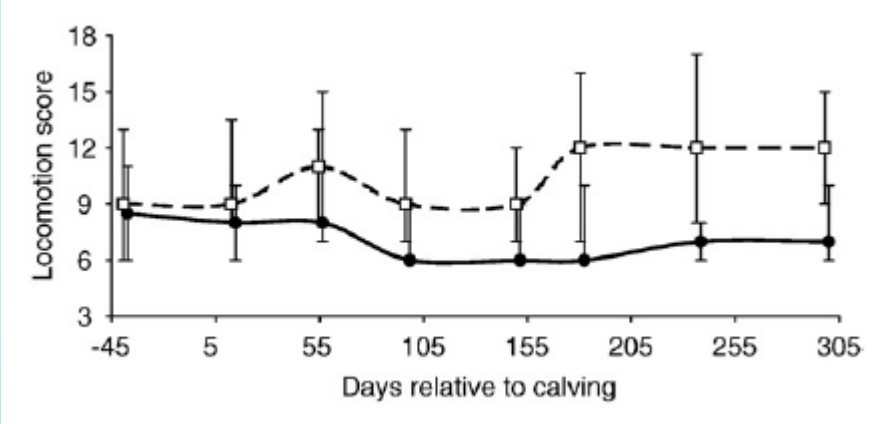
Free to download at:

http://www.agrisearch.org/publications/farmer-booklets

Cow Health

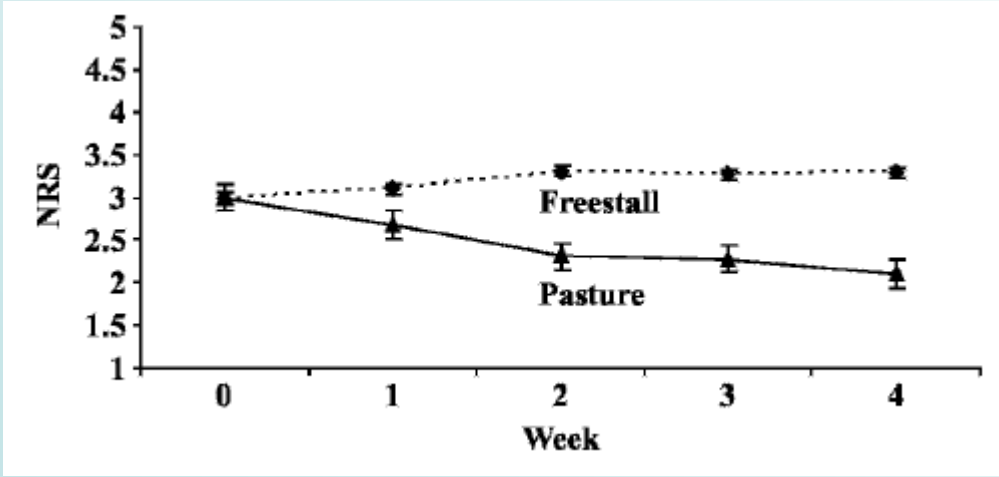
‘ lameness with Continuous housing

Evidence from controlled experiments



61% v. 17% clinical lameness prevalence

Olmos et al. 2009. Livestock Science, 125, 199-207



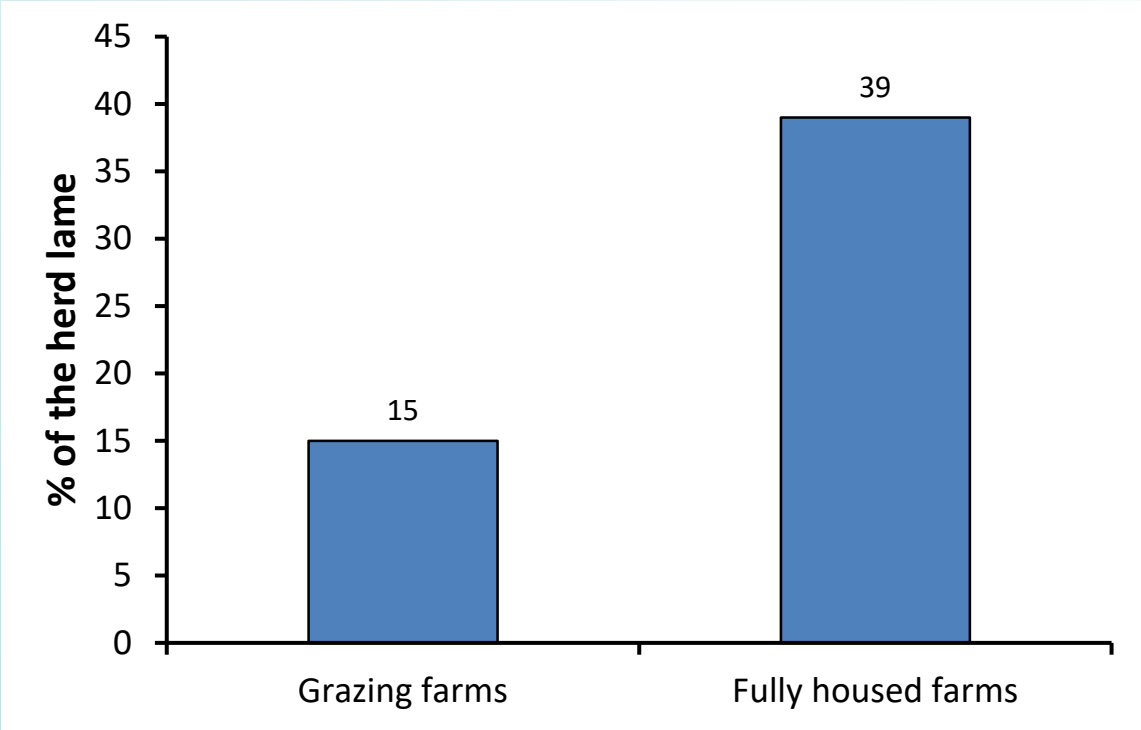
Hernandez-Mendo et al. 2007. JDS, 90, 1209-1214

Observational, epidemiological studies

J. Dairy Sci. 89:4259–4266

Housing System, Milk Production, and Zero-Grazing Effects on Lameness and Leg Injury in Dairy Cows

M. J. Haskell,[1] L. J. Rennie,[2] V. A. Bowell,[3] M. J. Bell, and A. B. Lawrence
Sustainable Livestock Systems Group, Scottish Agricultural College, United Kingdom



Barker et al. 2010, Chapinal et al. 2013, de Vries et al. 2015

‘ Digital dermatitis with continuous housing

- Rodriguez-Lainz et al. 1999
- Wells et al. 1999
- Somers et al. 2003, 2005
- Olmos et al. 2009
- Haufe et al. 2012

Beneficial mechanisms of pasture access? Could these be used to improve housing conditions?

Speculated benefits of pasture

- A comfortable, soft walking surface?
- A hygienic surface?
- Benefits of exercise?
- Improved lying times and resting bouts

‘ Hock lesions with Continuous housing

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animal

Daily grazing time as a risk factor for alterations at the hock joint integument in dairy cows

E. Burow†, P. T. Thomsen, T. Rousing and J. T. Sørensen

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‘ Mastitis with continuous housing

J. Dairy Sci. 85:105–111

Reproduction, Mastitis, and Body Condition of Seasonally Calved Holstein and Jersey Cows in Confinement or Pasture Systems

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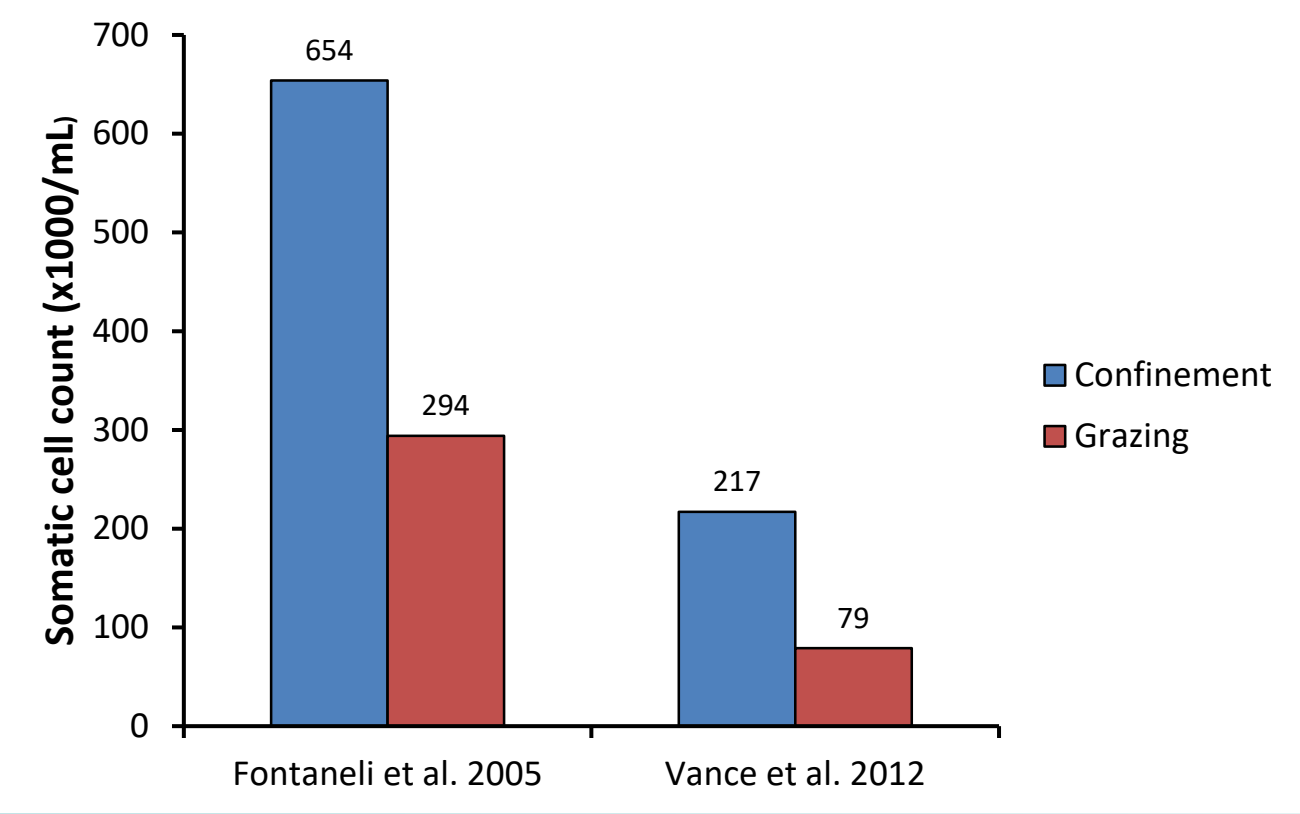
†Department of Crop Science,
‡Department of Agricultural and Resource Economics,
North Carolina State University, Raleigh 27695

Mastitis measure	Confined cows	Grazing cows
% cows with at least one case of clinical mastitis	51	31
Number of cases of clinical mastitis per cow	1.1	0.6
% of cows with mastitis that were culled or died	9.7	1.6

‘ Somatic cell counts with continuous housing



Other health problems

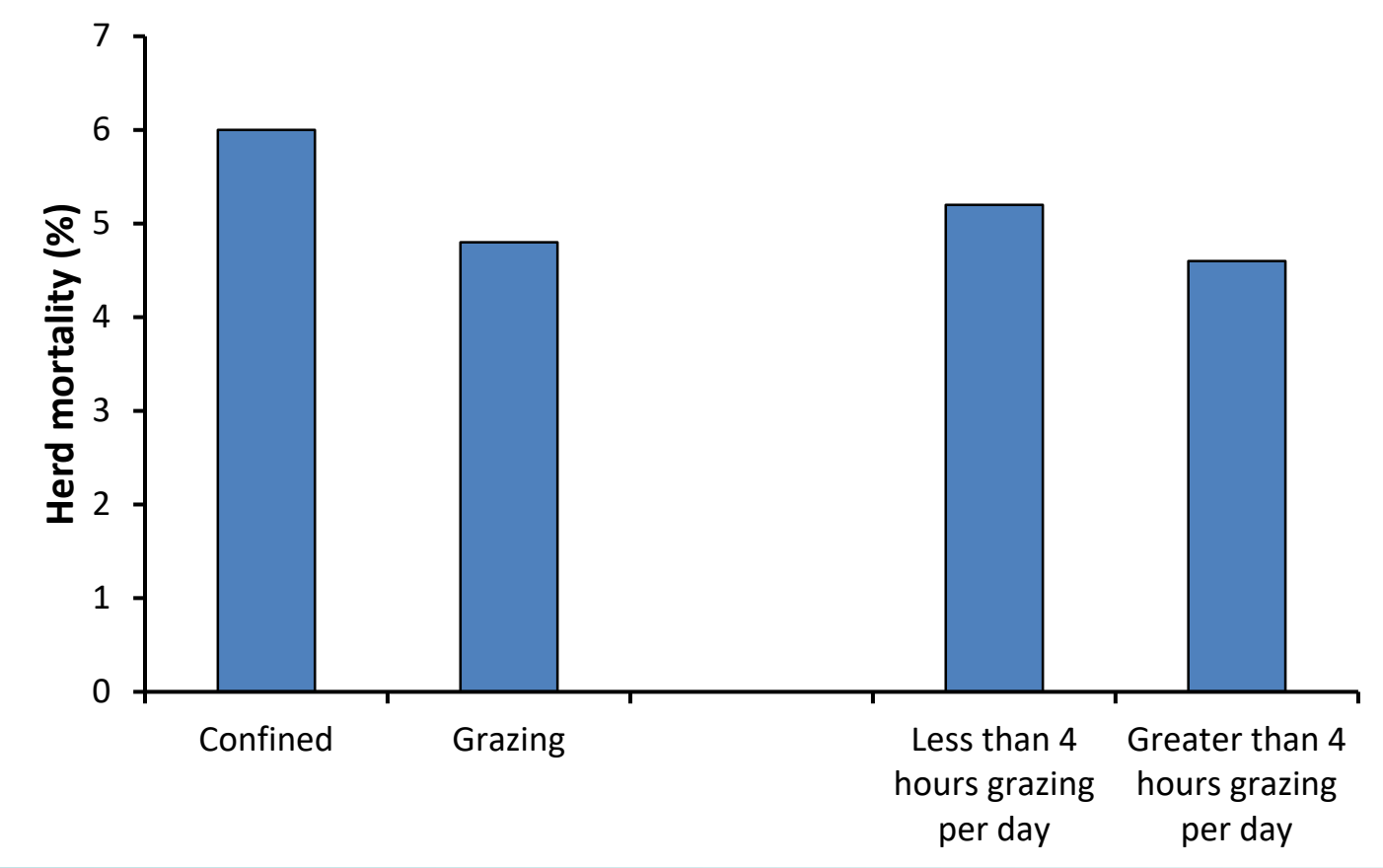
Increased risk with continuous housing

- Uterine disease (metritis and endometritis)
- Infectious disease (e.g. salmonellosis)

Increased risk in grazing systems

- Nematode gut parasites
- Liver fluke

‘ Mortality with continuous housing



Burow et al. 2011

Thomsen et al. 2006, 2007, Alvasen et al. 2012, 2014

Cow behaviour

Freedom to express normal behaviour

- Pasture based systems perceived to offer greater behavioural freedom
- What constitutes “normal” behaviour?

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Applied Animal Behaviour Science

journal homepage: www.elsevier.com/locate/applanim

In pursuit of "normal": A review of the behaviour of cattle at pasture

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- Grazing, ruminating and resting = 90-95%
- Most grazing performed during the day
- Grazing peaks associated with sunrise and sunset

Few studies have compared behaviour in pasture vs. housed systems

Differences in:

- Feeding behaviour — Roca-Fernandez et al. 2013
- Lying/standing — Olmos et al. 2009, O'Connell et al. 1989, Singh et al. 1993
- Aggression — O'Connell et al. 1989, Miller & Wood-Gush 1991
- Loss of behavioural synchrony with housing
- Knowledge gaps and implications for welfare?

Assessed by asking what the cow wants!

Preference testing

V.

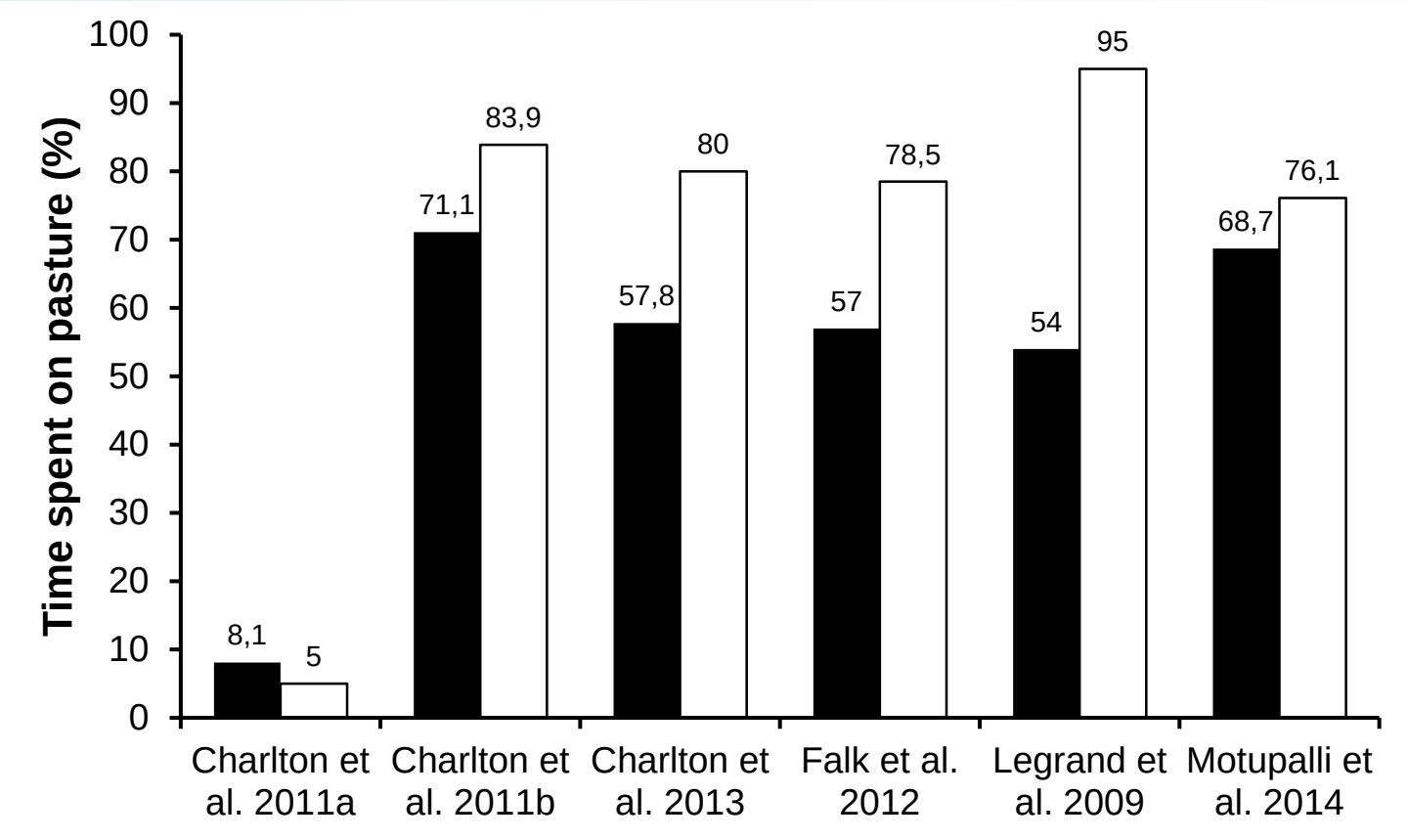
Indoors

Ad lib TMR

Pasture

Images courtesy of Charlton, Rutter & Motupalli

Summary of studies investigating whether cows prefer to spend their time in a house or at pasture



Not a simple preference

Modified by a range of factors

Knowledge gaps

Ideal scenario?

Provide cows with both options

Is it practically feasible?

Cow Physiology

‘ NEB in pasture systems

Olmos et al. 2009b, Kolver & Muller 1998, Bargo et al. 2002, Boken et al. 2005, Fontaneli et al. 2005, Kay et al. 2005, Vance et al. 2012

Adverse weather as a stressor.

Tucker et al. 2007, Webster et al. 2008, Schutz et al. 2010

Welfare benefits of sunlight?

- ‘ DMI
- Improved management of body condition / “ NEB
- Not exposed to adverse weather

- “ lameness, hoof pathologies & hock lesions
- “ mastitis & uterine disease
- “ mortality
- ‘ behavioural freedom and preference for pasture

“when possible, dairy cows and heifers should be given access to well managed pasture or other suitable outdoor conditions, at least during summer or dry weather” (EFSA 2009)

Conclusions

- Some see a move to continuously housed systems as inevitable.
- Results of this review highlight there are still considerable welfare benefits of incorporating pasture grazing into production systems
- Research to incorporate the welfare benefits of pasture-based systems within the housed environment.

Thanks for listening!

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