Dairy cow welfare:
To protect we have to measure

Laura Boyle

B.Agr.Sc., Ph.D.

Animal and Grassland Research and Innovation Centre, Moorepark,
Fermoy, Co. Cork, Ireland

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EUROGROUP FOR ANIMALS

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Presentation content

- Introduction
  - Characterise milk production systems
- Major challenges for cow welfare in the EU in the context of two milk production systems
- Potential implications for cow welfare of expansion in the Irish dairy industry
- Measuring cow welfare
- Conclusions

Introduction

- FAO forecasted 50% increase in global demand for dairy products by 2050
- With end of milk quota in 2015 this changed dairying in the EU
- Expansion of dairy herds and intensification of management systems
- Risks to welfare with intensive dairy management systems *(Oltenacau and Broom, 2010)*
- Growing public concern about dairy cow welfare *(Eurobarometers)*
- "... may be the 2nd greatest animal welfare problem in the EU" *(Report for EP Petitions Comm. on animal welfare by DG for Internal Policies, 2017)*
- European Food Safety Authority (EFSA) report and opinions on dairy cow welfare *(EFSA, 2009)*

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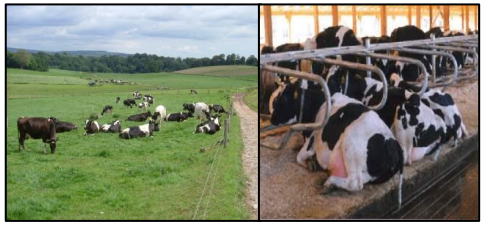
EU dairy management systems

- Risks to cow welfare of 4 milk production systems: (i) cubicle housing, (ii) tie stalls, (iii) straw yards & (iv) pasture *(EFSA, 2009)*
- Pasture = grazing+cubicle housing ➡ 'hybrid system' *(Somers & O'Grady, 2015)*



Characteristic	Pasture based (PB)	Cubicles (CUB)
Housing	2-7 months p.a.	All year
Grazing/outdoor access	5-10 months p.a.	None (or some loafing)
Calving	Seasonal	Year round
Diet	Grass/grass silage (+ concentrates)	Total mixed ration (TMR)
Production parameter	Milk solids	Volume (+20% higher)

Adapted from Mee, J.F. (2012) Reprod. Dom. An. 47: 42-50

Pasture based *vs.* Cubicles

Housing
++++
++
Management
++++
++++
Nutrition/feeding
++
++
Genetics
+++
++

Housing
+
-
Management
++
++
Nutrition/feeding
++++
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Genetics
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Housing
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Management
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Nutrition/feeding
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Genetics
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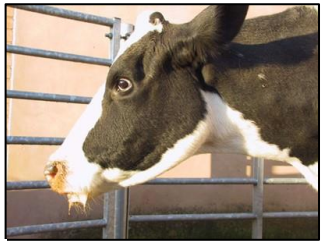

Housing
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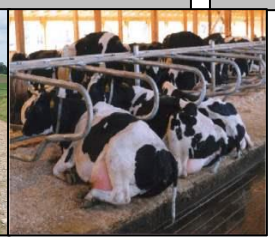

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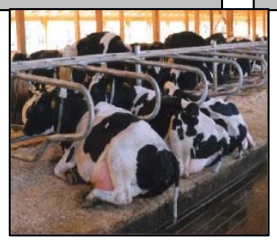
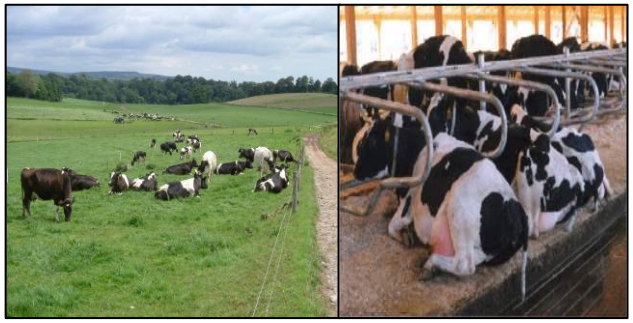


Pasture based *vs.* Cubicles

- Welfare advantages of pasture based systems *(e.g. Olmos et al., 2009; Arnott et al., 2017)*



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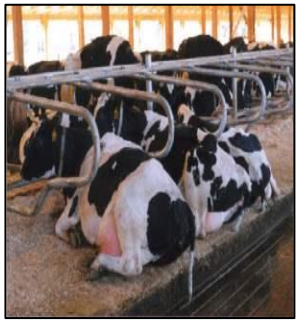
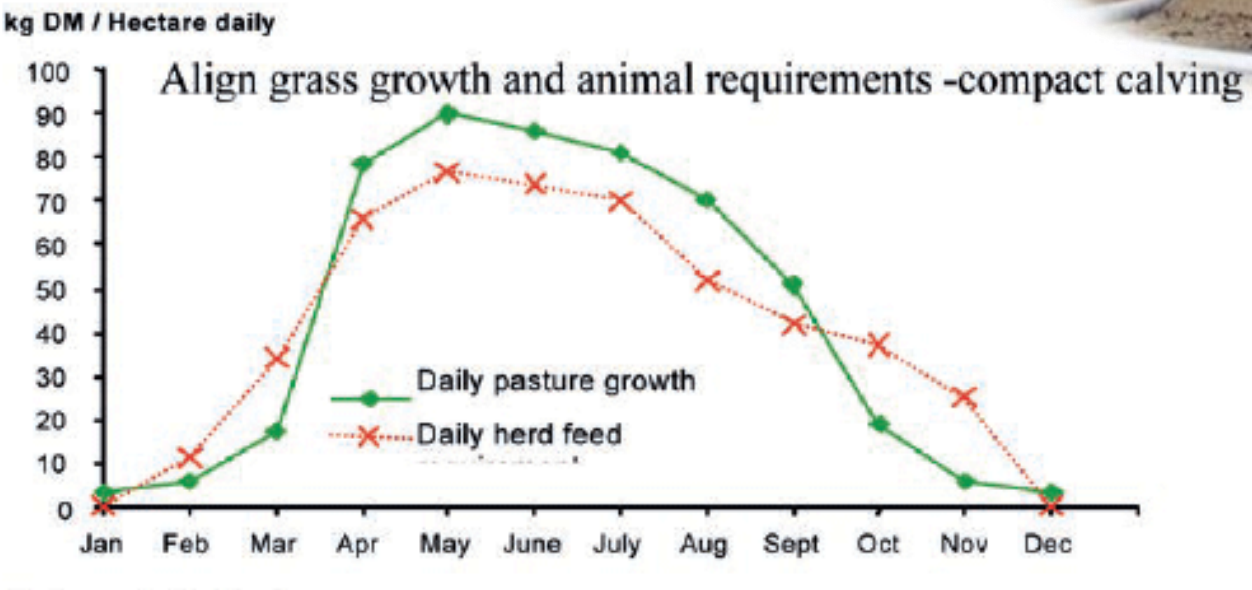


- Grass tetany, internal/external parasitism & phytotoxicities
- Negative energy balance/metabolic stress, ketosis and sub-acute ruminal acidosis

(Kolver and Muller, 1998; Washburn et al., 2002; Boken et al., 2005; Fontaneli et al., 2005; EFSA, 2009; Olmos et al., 2009b; Burow et al., 2012; Mee, 2012; Arnott et al., 2017)

Post-quota features of Irish dairying associated with potential risks to cow welfare

- Focus on low cost system for profitability
- Maximal grass in the diet
- Larger herds, fragmented land base
- Labour and €€€ challenges
- New entrants to dairying



(Brendan Horan Dairy Conf. 2012)

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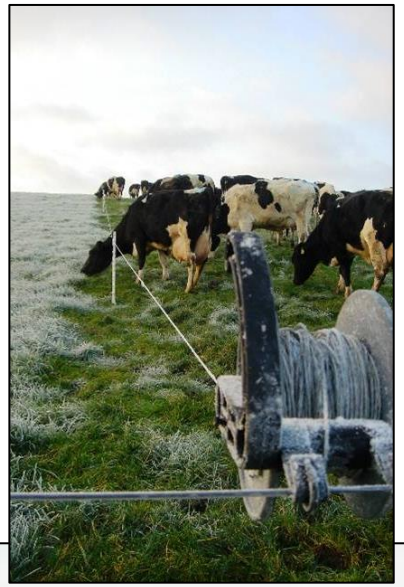
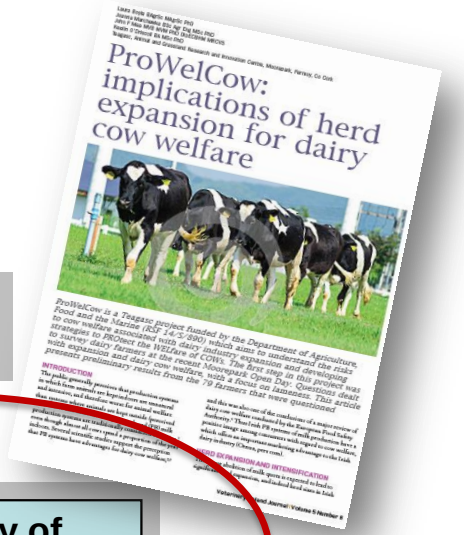
Potential risks to cow welfare *(as per Boyle & Rutter, 2013 British Grassland Conference)*

- Energy balance/environmental stress?
- Changes in management/herding practices?
- Longer walking distances/milking times?
- Lack of investment in infrastructure?
- Knowledge gaps?



Strategies to PROtect and improve the WELfare of dairy COWs in Irish systems of milk production

PROWELCOW



Task 1.
Literature Review & EBI work

Task 2. Study trips

Task 3. Stakeholder interviews

Task 4. Survey of management practices

Task 5. Development of a *pasture based* cow welfare assessment scheme

Task 6. Implementation and dissemination

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Stakeholder survey

- Aimed to establish opinions and changes in management practices and infrastructure on Irish dairy farms
- 40 prompted and open ended questions focused on changes in past 3 years
- Farmers (n=115) surveyed directly at two national farming events
- Cattle veterinarians (n=60) surveyed at annual conference
- Dairy advisors (n=48) completed survey at a Teagasc training day

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Study farms

	Mean (SD)	Min.	Max.
Milk yield (l/cow/day)	21.6 (4.0)	9.0	33.0
Concentrates (tonnes/cow/year)	0.9 (0.5)	0.0	3.0
Winter housing period (no. months)	3.8 (1.0)	2.0	7.0

- Spring calving herds with cows over-wintered in cubicles
- 77% of farmers expanded their herd size in past 3 years

c. 80% of participants in 3 groups agreed expansion poses more risks than benefits to cow welfare

Primary concerns for dairy cow welfare in each stakeholder group

Welfare concern	Advisors	Farmers	Vets
Lameness	2.1[a]	13.0[a]	28.3[b]
Poor body condition	10.4[ab]	22.6[a]	8.3[b]
Social stress (due to overcrowding)	43.8[a]	14.8[b]	30.0[a]

Investment

Infrastructure	
No expansion	14.6%
Expanded herds	85.4%

Milking parlour	
No expansion	6.5%
Expanded herds	93.5%

No difference between expanded and no-expansion farms (P>0.05)

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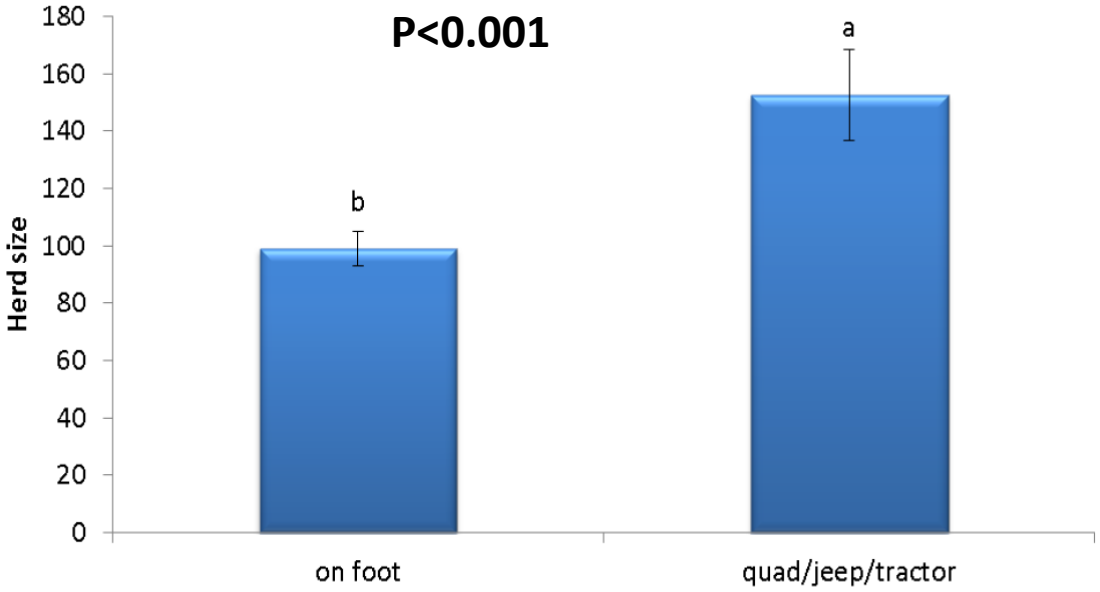
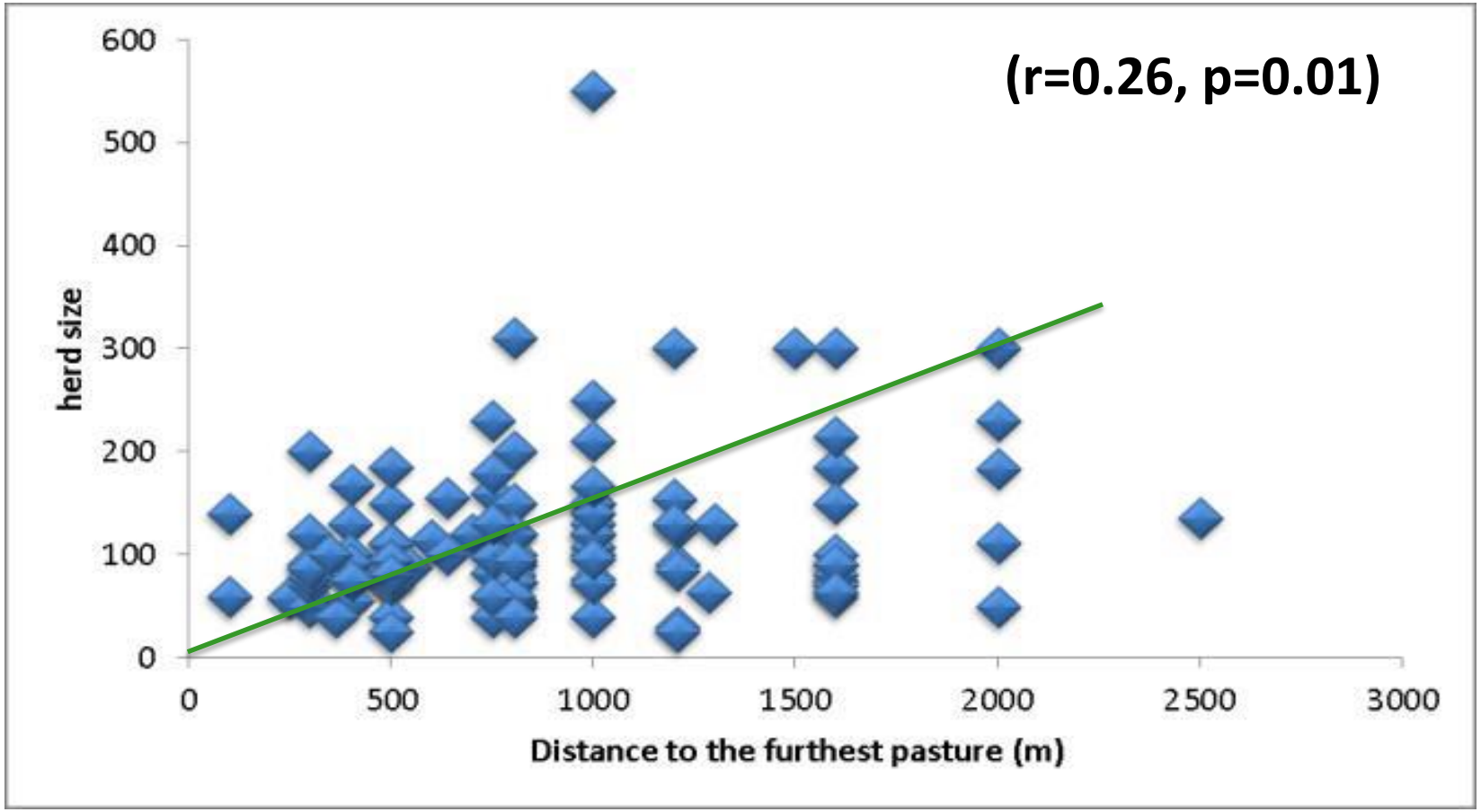
Herding practices

Herding method	Perception (%)		Actual (%)
	Vets	Advisors	Farmers
On foot	87.5[a]	90.0[a]	66.9[b]
Quad/jeep/tractor	4.2[a]	3.3[a]	32.2[b]



Positive correlation between distance to the furthest pasture and herd size



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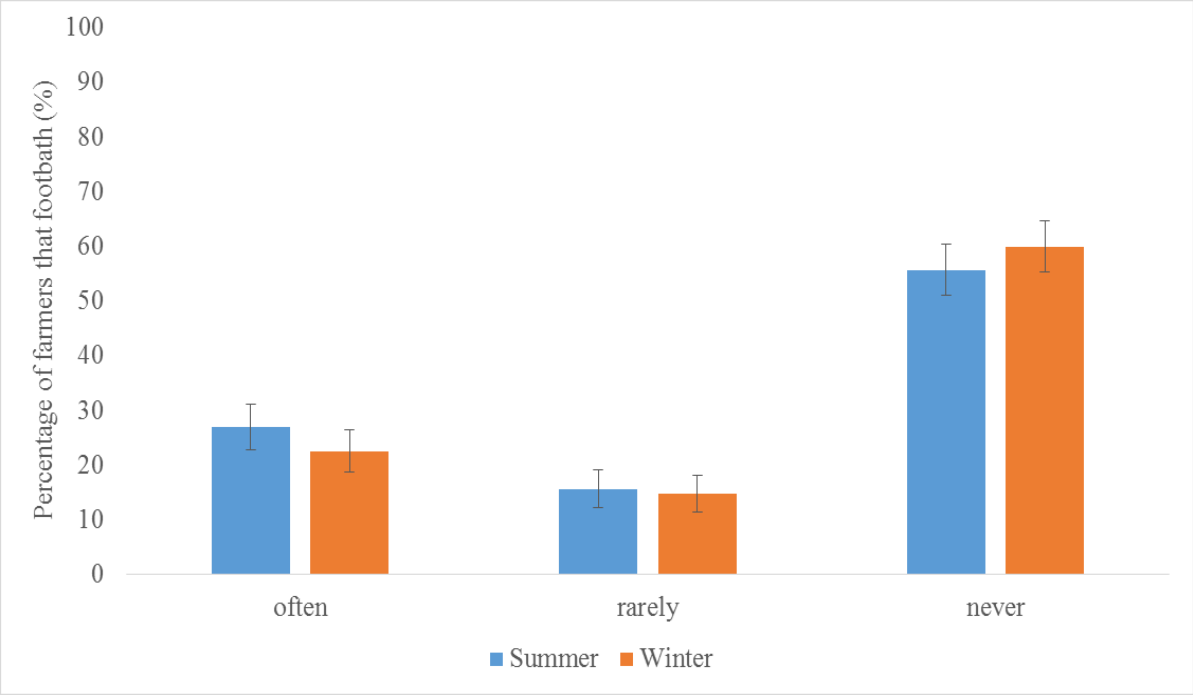
Footbathing practices



- Majority of farmers never footbath
- 1/3 of advisors do not recommend foot bathing in winter

Do you advise footbathing?	Advisors (%)	Vets (%)
Summer	60.4	63.3
Winter	64.6[b]	86.7[a]

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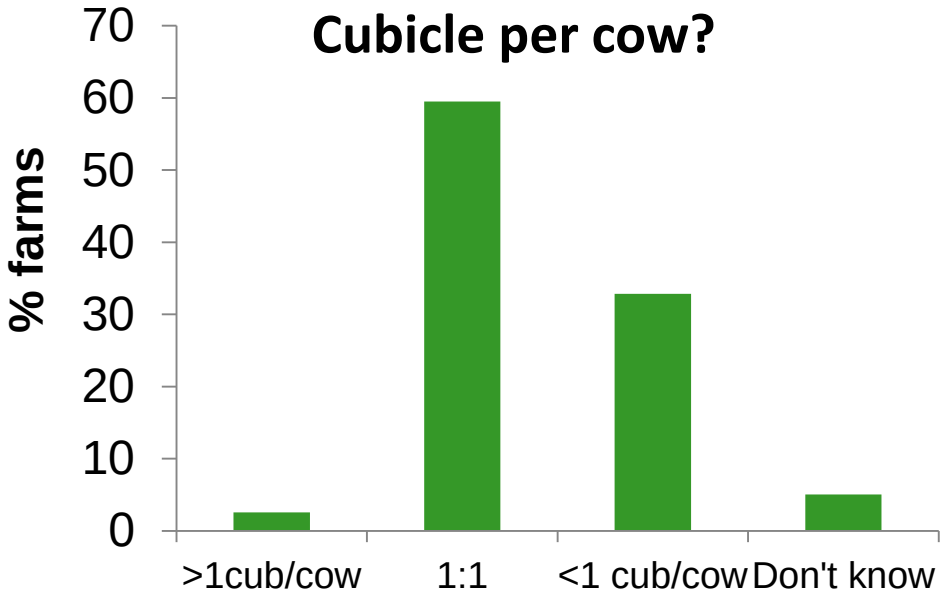
Cow housing: cubicles

Group	Is at least 1 cubicle/cow important for cow welfare?	
	No	Yes
Advisor	14.89%	**85.11%**
Farmer	**38.74%**	61.26%
Vet	3.33%	**96.67%**



Bedding

- 4% mats + straw (optimal)
- 68% using mats alone (average)
- c. 28% using nothing (sub-optimal)

More (62.5%) farmers who expanded provided 1 cubicle/cow compared to those who did not expand (37.5%)

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Pros and cons for cow welfare

Positives

- Good agreement that expansion poses risks to cow welfare (though stakeholders differ on priority areas)
- Investment in milking parlours
- Supplementation with concentrates

Negatives

- Lack of investment in housing and roadways
- Inadequacies in cubicle housing
- Poor lameness management protocols
- Changes in herding practices/long walking distances
- Knowledge gaps between stakeholder groups

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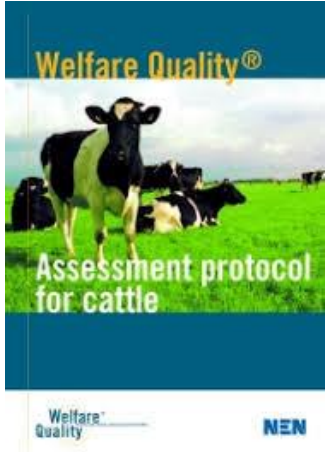
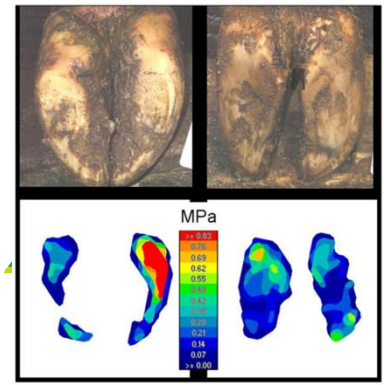
Lessons learned

- Study was desk based and focused on resources
- Need for multi year epidemiological study to confirm risks
- Hoof/limb lesion, locomotion, rumen fill and body condition scores, behaviour, clinical disease etc.
- +300,000 dairy cows, increase in proportion of cows in herds >100 cows: 4.5% → 23% [2005-2016] (State Vet. Officer Conf, April 2018)
- Important for farmers to include animal based indicators in their health and welfare management plans
- Benchmarking 'Farmers believe their own data'! (Dan Weary, WAFL 2017)

Measuring cow welfare



- Two main reasons for assessing welfare: Quality assurance and detection of problem farms
- National QA Schemes deficient in terms of measuring/protecting cow welfare (Task 3 ProWelCow)
- Welfare assessment protocols: Welfare Quality™
- Automated methods (Precision Livestock Farming)
- Routinely collected data (e.g. calf registrations) offer promise in identifying at risk farms *(e.g. Krug et al., 2015)*
- 'Iceberg indicators'



Conclusions

- Expansion threatens to erode positive welfare attribute of pasture based systems
- Housing, husbandry, nutrition and genetic improvement of dairy cows needs to reflect societal concerns for dairy cow welfare
- **One Welfare concept underpinned by scientific evidence could** play an important role in ensuring that both the dairy cow and the farmer benefits from addressing these concerns
- Ultimately standardised and routinely collected data relating to cow welfare is needed for benchmarking/decision support tool, to identify 'at risk farms' and to compare production systems

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Thank you!

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