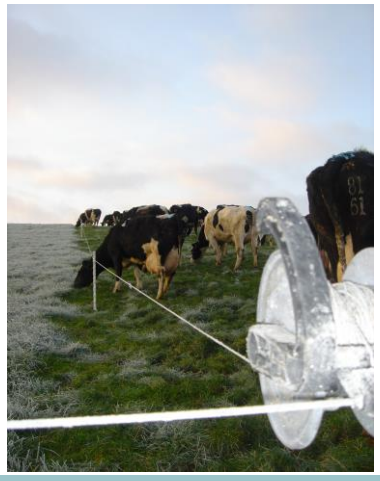
Project number: 6746
Funding source: Department of Agriculture, Food & the Marine (Stimulus Fund)
Date: May, 2018
Project dates: Jun 2015 – May 2016

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



Key external stakeholders:
All stakeholders in the dairy industry including dairy farmers, cattle veterinary practitioners, DAFM, Bord Bia, AHI, Ornua, Teagasc research, advisory and education services, 3rd level institutions and dairy co-operatives

Practical implications for stakeholders:
The welfare of Irish dairy cows is perceived as high amongst consumers of Irish dairy products at home and in our export markets. Indeed, previous Teagasc and other research confirms benefits to cow welfare associated with access to pasture. This project showed that key industry stakeholders perceived that the abolition of milk quota and associated expansion and intensification in the Irish dairy industry poses risks to dairy cow welfare. They also raised concerns about the impact of farmer (physical and mental) well-being on animal welfare. Stakeholder fears were supported by findings regarding a lack of investment in housing and roadways, longer walking distances and changes in herding practices as well as knowledge gaps in lameness prevention strategies. In the short term, changes/improvements to the EBI and the Bord Bia Sustainable Dairy Assurance Scheme (SDAS) could mitigate against such threats and the dairy co-ops could play an important role in raising welfare standards. In the long term, considerable efforts are required by all stakeholders to better self-inform regarding dairy cow welfare. The latter can be facilitated by the excellent infrastructure of knowledge generation and dissemination (Teagasc/Co-op advisors and researchers, discussion groups and ICBF etc.) which already exists within Irish dairying.

Main results:

- Farmer surveys showed that investment in infrastructure in expanding herds has mostly been directed towards improving milking facilities and not towards other buildings and roadways. This has negative implications for the welfare of cows in an industry where cows are indoors for, on average 4 months per year, the distance cows have to walk is increasing and herding practices are changing
- There is complacency about cow welfare and a lack of consensus about the meaning of welfare
- Farmer, advisor and veterinary practitioner surveys showed that there are significant knowledge gaps regarding welfare and an under estimation of the scale of lameness in Irish dairy herds
- Absence of animal-based indicators in the SDAS and poor scientific underpinning of the implied welfare aspect of the scheme as well as a case for strengthening weighting on lameness in the EBI
- Dairy industry stakeholders reported that mental and physical health challenges in farmers pose a threat to the welfare of dairy cows
- Protective factors include the general positive implications access to grass has for cow welfare, investment in milking facilities, initiatives shown by some of the co-ops in raising welfare standards, and aspects of the EBI which will result in improvements to cow health and welfare
- Good existing infrastructure (Teagasc/Co-op advisors and researchers, discussion groups and ICBF) to improve knowledge generation and knowledge dissemination on Irish dairy cow welfare

Opportunity / Benefit:

The results of this research have:

- Confirmed that, in general, access to pasture has many positive implications for cow welfare
- Confirmed threats to dairy cow welfare associated with expansion/intensification in the dairy industry

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- Demonstrated where changes could be made to existing support structures (EBI, SDAS) to improve and protect the welfare of Irish dairy cows
- Identified knowledge gaps amongst stakeholders in the area of dairy cow welfare and lameness
- Highlighted the need for epidemiological research on risk and protective factors in grass-based production systems to form a platform for a wider series of studies relating to dairy cow welfare
- Contributed to the development of a protocol to assess cow welfare for use in epidemiological research in pasture based systems

Collaborating Institutions:
University of Westminster, London; SRUC, Scotland; Queens University Belfast (QUB) and Ornua

Teagasc project team:
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1. Project background:

Scientific evidence suggests that there are advantages and disadvantages to dairy cow welfare and reproductive performance associated with pasture based systems of milk production (Mee, 2012; Boyle and Rutter, 2013). However, consumers perceive pasture based systems as 'natural' and therefore better for cow welfare than confinement systems. This offers a marketing advantage to Irish dairy products. Irish systems of milk production will also have an advantage over countries in which milk is primarily produced from confined cows should legislation protecting cow welfare (and favouring pasture-based systems) be passed in the EU. It is speculated that such legislation would ensure that all dairy cows have some outdoor access. Such advantages could be threatened by expansion in the Irish dairy industry arising from the abolition of quota because of associated risks to cow welfare. One of the main features of expansion de facto is larger herd sizes which are likely to be associated with longer walking distances, higher stocking densities and lower number of labour units/cow (Boyle, 2013). These characteristics have potential negative implications for dairy cow welfare (Oltenacau and Broom, 2010), particularly in terms of lameness (Barker et al., 2009) but also in terms of metabolic, climatic and social stress and health and welfare in the peri-parturient period. A proactive approach must be taken to addressing such welfare issues not only from an ethical point of view and because of their impact on productivity/profitability but also to protect the strong positive image of Irish dairying held by consumers of Irish dairy products at home and abroad.

2. Questions addressed by the project:

- What does the existing scientific literature tell us about cow welfare in pasture based production systems?
- Can we identify dairy industry strengths and weaknesses in addressing the challenge of protecting and improving cow welfare post-quota?
- What can we learn from quality assurance schemes in other countries regarding cow welfare assessment in grass based systems and is there anything that can be implemented in Bord Bia's SDAS?
- Can we breed dairy cows for better welfare and if so how should the EBI be altered?
- What are the opinions and attitudes of stakeholders in the dairy industry regarding dairy cow welfare?
- What housing and management deficiencies need to be addressed to protect dairy cow welfare?

3. The experimental studies:

The ProWelCow project accomplished these objectives through 'desk-based' research activities divided into the following 6 tasks: 1) review of the scientific and technical literature; 2) workshops; one at the EAAP Annual Conference in Poland, 2015 (40 participants) and a 2nd more focused one at the Polish Institute for Animal Breeding in May 2016 (15 participants) to determine the potential of breeding for better welfare; 3) international study trips (n=3) to review QA schemes abroad and meetings with Bord Bia to discuss the SDAS as well as accompanying inspectors on 3 farm inspections; 4) in-depth face-to-face interviews with 30 stakeholders in the dairy industry; 5) face-to-face survey questionnaires with 115 dairy farmers (at two national farming events during the summer of 2015), cattle veterinarians (n=60) and Teagasc dairy advisors

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(n=48) to determine current and emerging practices with implications for cow welfare; 6) liaising with Ornua and animal welfare scientists at SRUC and in QUB to develop an epidemiological project (and associated welfare assessment protocol) to evaluate risk and protective factors for cow welfare on Irish dairy farms.

4. Main results:

Task 1 – Literature review

- In spite of a lack of epidemiological data on cow welfare/lameness in pasture based systems there is good evidence of benefits to dairy cow health, welfare, reproductive performance and longevity associated with access to pasture compared to year round confinement systems
- There are risks of suboptimal body condition score and climatic stress in pasture based systems
- Mastitis and lameness are major production diseases in pasture based as well as confined systems

Task 2 – Breeding for better welfare

- Animal welfare issues of concern to society relate to issues associated with negative mental states (pain, suffering) and include lameness, mutilations, neonatal survival and poor body condition/hunger
- All traits in the Irish breeding index (Economic Breeding Index-EBI) are solely derived from their economic impact and don't take account of societal implications
- The multifactorial nature of animal welfare means there is no single 'welfare' indicator ('trait') that can be included in the EBI
- Many existing indicators of relevance to cow welfare do not fulfill the criteria for inclusion in a breeding index because they are not easily or cheaply measured
- Several existing EBI traits have relevance to cow welfare (e.g. ease of calving, SCC and lameness)
- Body condition score of Irish dairy cows is likely to improve as an indirect result of selection for improved fertility and lower maintenance requirements in the EBI
- Lack of accurate data on individual cow clinical mastitis incidence to incorporate clinical mastitis as a welfare indicator in the EBI to facilitate selection against this disease
- Analysis of the EBI in light of the changes in farming practices associated with expansion suggest that there may be a case for strengthening the current weighting on lameness
- There is a need for research to identify new welfare traits, on new ways of deriving weightings for such traits and on ways of improving routine access to data on these or correlated traits to facilitate higher accuracy of selection
- The project identified a need for a Delphi study to gauge stakeholder opinion of the importance of detailed cow welfare traits within an overall dairy breeding goal for profit, with the aim of assessing its suitability as a complementary, participatory approach to defining breeding goals

Task 3 – Evaluation of QA schemes

- Few animal based welfare outcomes in any of the quality assurance schemes reviewed internationally (apart from the UK RSPCA scheme)
- No animal based welfare indicators specific to pasture based systems of milk production were identified in any of the schemes indicating the need for research in this area
- Few of the schemes (except RSPCA) raise standards above baseline levels required by legislation
- Poor transparency of overall/aggregated results of inspections conducted for quality assurance schemes for external use or review
- Lack of objective data to support claims made by the schemes and the stated benefits to society (the animals, the environment etc.)
- Many of the schemes relied more heavily on the inspection of records than of resources and the animals themselves even though the latter are of more relevance to animal welfare

Task 4 – Stakeholder interviews

- Welfare was seen by most as an essential component of the 'Green Ireland' brand
- Increasing demands from international buyers were cited as being the most important factor driving increased focus on cow welfare in the industry
- A common view was that cow welfare was not a problem within the industry and that measures were already in place to protect it
- Bord Bia's SDAS was generally well regarded though some thought it should be extended to better address cow welfare issues
- Vulnerability of the industry to volatile milk prices and mental/physical health challenges for farmers were seen by many as risks for cow welfare

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- Agreement that there is good existing infrastructure (Teagasc/Co-op advisors and researchers, discussion groups and ICBF) to put in place a network for improved knowledge (e.g. research on welfare indicators) and knowledge dissemination
- Agreement that the Co-Ops are playing an important role in raising standards (even above those required under the SDAS)

Task 5 - Survey of housing and management practices

- In all 3 surveyed groups c. 80% of people believed that expansion poses risks to cow welfare
- Low BCS was ranked as the main welfare concern by a higher proportion of farmers (72.2%) than vets (13.9%) or advisors (13.9%). The most vets selected lameness as the main cause of poor welfare (28.3%), followed by farmers (13%) and advisors (2.2%) while the most advisors identified overcrowding as the main welfare problem
- 59.5% of farmers provided 1 cubicle per cow, 33% provided less than 1 cubicle per cow, 5% of farmers did not know and 2.5% of farmers followed recommended best practice (>1 cubicle/cow)
- Farmers reported that 1.6% (0-10%) of their cows were lame at the time of the survey
- Over 50% of farmers never footbath with 15% footbathing regularly all year round
- 86.7% of vets recommend foot bathing during the winter compared to 64.6% dairy advisors ($P<0.05$); majority of both groups (+87.5%) recognized importance of herding on foot
- 87.8% of farmers who use the farm relief service use them only for lame cows while 5.4% also use them to routinely pare the entire herd (recommended best practice)
- More (62.5%) farmers who expanded provided a cubicle per cow compared to those who did not expand (37.5%) ($P<0.05$) and farms on which mats and bedding were provided were largest

Task 6 – On-farm welfare assessment protocol

- ProWelCow research found that no animal based indicators specific to pasture based systems of milk production have been validated for inclusion in on-farm welfare assessments/quality assurance schemes
- A scientific protocol developed to assess the welfare of dairy cows in confined and organic systems in the UK by researchers in the SRUC was modified and adapted for use in Ireland
- Questions were developed relating to grassland management/grazing and animal based indicators relating to cow behaviour during herding and while holding in the collecting yards
- The latter need to be validated in future controlled experiments related to the development of animal based indicators relevant to pasture based systems of milk production

5. Opportunity/Benefit:

- This research has provided research performing organisations with direction as to the priority areas where research on strategies to protect/improve cow welfare is required
- The outcomes of this project can be used by marketing bodies such as Ornua to illustrate the strong proactive approach to dairy cow welfare in Ireland
- The dairy cow welfare assessment scheme developed for use with pasture based systems of milk production could be used in a large scale evaluation of dairy cow welfare in Ireland and aspects could also be adapted for use in private assurance schemes (also potentially in Bord Bia's SDAS)
- The information generated during the critical evaluation of the EBI in terms of its likelihood to protect cow welfare can be used by ICBF etc. to inform future developments in the index

6. Dissemination:

Main scientific publications:

Boyle, L.A., Marchewka, J., Berry, D. and Mee, J.F. (2017). ProWelCow – Dairy cow welfare. *T Research*, Teagasc, Autumn Vol. 12 No. 3, pgs. 12-13.

Boyle, L.A., Conneely, M., Marchewka, J., Rieple, A., Snijders, S., Berry, D.P. and Mee, J.F. (2017). ProWelCow: Understanding risks and protecting Irish dairy cow welfare. In proceedings of the Moorepark Open Day: Irish dairying: Resilient technologies, July 4th, 2017. pp. 146-147.

Boyle, L.A., Marchewka, J., Mee, J. F. and O'Driscoll, K. (2015). ProWelCow: implications of herd expansion for dairy cow welfare. *Veterinary Ireland Journal*. 5 (9):425-428

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