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Suckler Beef Systems Research Farm



Key external stakeholders:

Beef farmers, ICBF, beef cattle breed societies, AI companies, beef industry, Teagasc advisory, agri-consultants, scientific community

Practical implications for stakeholders:

- Limousin × Holstein-Friesian remains the 'benchmark' suckler cow breed type. However, crossbred beef breed cows with good maternal traits can achieve an almost comparable performance.
- Grazing to a lower residual sward height (4.4 vs. 5.6 cm) had no significant effect on live weight gain of pregnant breeding heifers, whereas with lactating suckler cows, grazing to a lower residual sward height (4.1 vs. 5.3 cm) had a negative effect on growth rate of their calves.
- Early turnout to pasture in spring of beef suckler cows, via restricted ('on-off') or full-time grazing, is a strategy to reduce feed and slurry handling costs in beef production systems.

Main results:

Suckler cow breed comparison:

i.e. Limousin × Holstein-Friesian (LF), Limousin × Simmental (LS), Charolais × Simmental (CS) and Charolais × Limousin (CL) cows.

- Silage intake pre-partum did not differ between the cow breed types. At weaning, LF cows were lighter and thinner than the beef crossbred cows, which did not differ. Milk yield was highest for LF and lowest for CL, with breed types having Simmental ancestry, being intermediate.
- Differences between breed types in progeny weaning and slaughter weights reflected breed differences in milk yield. Carcass weight per day of age did not differ significantly between breed types. Carcass conformation score was lower for LF than the beef crossbreds, whereas carcass fat score did not differ between breed types.

Grassland management studies:

- Grazing to a lower residual sward height (4.4 vs. 5.6 cm) with pregnant beef heifers had no significant effect on live weight gain. With lactating suckler cows, grazing to a lower residual sward height (4.1 vs. 5.3 cm) resulted in lower body condition score gain and had a negative impact on growth of their calves.
- Early turnout to pasture in spring of beef suckler cows, via restricted (6 hours daily - cows only) or full-time (cows and calves) grazing, resulted in transitory benefits in animal performance; However, replacement of more expensive feedstuffs with cheaper produced grass (and reduced slurry handling) meant significant cost savings.

Opportunity / Benefit:

- Suckler beef farmers have opportunities to select their replacement heifers from either the dairy herd or from within the suckler herd.
- Early turnout to pasture in spring of beef suckler cows, via restricted or full-time grazing, is a strategy to reduce costs in beef production systems.

Collaborating Institutions:

N/A

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External collaborators:	N/A

1. Project background: Suckler cow breed comparison

Sourcing heifer replacements from within the suckler herd (rather than from the dairy herd) in Ireland has resulted in a reduction in proportion of the dairy ancestry in cows and consequently reduced milk yield, and calf weaning weight. Milk yield is an important determinant of lifetime live weight performance in spring-calving calf-to-beef systems where no creep feed is offered to calves pre-weaning. Incorporation of Simmental genetics may be a breeding strategy for maintaining moderate milk production in beef crossbred cows.

Grassland management studies:

As grazed pasture is considerably cheaper than conserved forage or concentrates, economic sustainability of beef production systems depends on optimising the contribution of grazed grass to the lifetime intake of feed and on providing silage and concentrate as efficiently and at as low a cost as feasible. Consequently, strategies to further enhance the production and utilization of high yields of high-nutritive value grazed herbage and further increase the length of the grazing season, while, at least, maintaining animal performance are necessary.

2. Questions addressed by the project:

- In the context of replacement breeding strategies, what is the optimal cow breed ‘type’ for spring-calving grass-based suckler beef production systems?
- What effect does grazing to a lower residual sward height have on performance of pregnant beef heifers, and lactating suckler cows and their calves?
- What is the effect of early turnout to pasture in spring, via restricted (‘on-off’) or full-time grazing, on feed intake and performance of primiparous beef suckler cows and their calves?

3. The experimental studies:

The cow breed types selected (all crossbreds - to exploit hybrid vigour/heterosis) broadly represented about two-thirds of the suckler cow “types” nationally and also the main replacement breeding strategies available to farmers i.e. sourcing replacement heifers from the dairy herd (i.e. Limousin x Holstein-Friesian - LF) or from the suckler herd (i.e. Limousin x Simmental - LS, Charolais x Simmental – CS, Charolais x Limousin - CL). The breeds used also corresponded to ca. 80% of sires bred to suckler cows, nationally. The three beef crossbred cow types represented replacements sourced from within the suckler herd using a two-breed rotational crossing breeding programme. The Limousin x Simmental is the “end result” of an ‘upgrading’ of the Simmental x (Limousin x Simmental) cow type used in previous studies at Grange. Within the beef crossbreds, Simmental was used to demonstrate ‘high maternal’ milk. They were bred to Blonde d’Aquitaine sires (i.e. a ‘third’ breed), using both artificial insemination and natural mating over 3 months, to maximise heterosis and to avoid breed confounding.

Animals were evaluated within an integrated spring-calving grass-based calf-to-beef production system, operated at a relatively high stocking rate. Calving date coincided with the start of the prevailing grass-growing season. Data from the first production cycle phase is presented. Consequently, all cows were first-calvers (mean calving age ca. 30 months).

Breeding heifers of known parentage and genetic merit (suckler beef value – SBV) were identified through ICBF and purchased off-farm. They ranged in age from ca. 12 to 24 months. They were assigned to one of two grazing management systems: grazing to a sward height of either ‘4.0’ or ‘6.0’ cm. There were two replications of each grazing system resulting in four grazing groups. The stocking rate was 2.5 LU/ha for each grazing system. The grazing season was from March to early November during which, animals were rotationally grazed on perennial ryegrass-based swards. Fresh herbage was allocated to each system once the target post-grazing residual height was achieved. Herbage surplus to grazing requirements (i.e. when farm cover exceeded requirements) was removed from the rotation by harvesting relevant paddocks for silage.

During the winter indoor period (commencing Nov.) pregnant heifers were offered grass silage *ad libitum* and one month pre-partum, ~30% straw was included in the diet. Post-partum, they were offered grass silage *ad*

libitum and 2 kg of concentrate daily until turnout to pasture (25 March).

Post-partum, early-calving cows were allocated to one of three dietary treatments: (i) Indoor feeding (IF): grass silage *ad libitum* plus 2 kg of concentrate daily, (ii) Restricted grazing (RG): 6 hours daily in one bout (cows only) plus 0.3 of mean pre-experimental grass silage dry matter intake (DMI) plus 2 kg of concentrate daily, and (iii) Full-time grazing (FG): (cows + calves). Animals on grazing treatments were offered *ad libitum* fresh pasture daily. Dietary treatments lasted from 1 March to 29 March.

For the main grazing season, cows and their calves were assigned to one of two grazing management systems - grazing to a sward height of either '4.0' or '5.5' cm (as outlined above) - and were rotationally grazed together until weaning in early November. The stocking rate was 2.9 LU/ha equivalent to ~220 kg of organic nitrogen/ha for each grazing system.

Post-weaning, calves were housed indoors in slatted floor pens. They were offered grass silage (DMD ~73%) *ad libitum* plus 2 (bulls) or 1 (heifers) kg/head daily of a barley-based concentrate. At the end of the first winter (March) they were turned out to pasture and rotationally grazed for 114 (bulls) or 205 (heifers) days. Following housing, bulls were gradually introduced to barley-based concentrates *ad libitum* plus ~1 kg grass silage DM/head daily until slaughter 85 days later (~18.5 months of age). Prior to housing heifers were offered concentrates at pasture for 16 days, then housed and offered grass silage *ad libitum* plus 4.6 kg concentrates/head daily, until slaughter 63 days later (~20.5 months of age).

4. Main results:

Suckler cow breed comparison:

- The LF heifers were lightest and CS heifers were heaviest with LS and CL being intermediate; however, live weight gain at pasture did not differ between the breed types. Grazed grass DMI did not differ significantly between the heifer breed types (in early pregnancy) either on an absolute basis or relative to weight. Mean intake was ca. 2% of live weight.
- Grass silage DMI during late pregnancy and calf birth weight was similar for all breed types. At weaning, LF were lighter and thinner than the beef crossbred cows, which did differ. Milk yield was highest for LF and lowest for CL with breed types having Simmental ancestry being intermediate. Differences in calf pre-weaning growth between breed types largely reflected differences in milk yield.
- Weaning weight and live weight gain from birth to weaning and slaughter was greater for LF than CL with breed types having Simmental ancestry being intermediate. However, carcass weight per day of age did not differ significantly between breed types. Carcass conformation score was lower for progeny from LF compared to the beef crossbreds but carcass fat score was not significantly different.
- Additionally, results clearly demonstrated that the relative emphasis on terminal traits compared to maternal traits in the SBV Euro-Star Rating Index was too great.

Grassland management studies:

- Grazing to a lower residual sward height - 4.4 vs. 5.6 cm - had no significant effect on growth-related performance of beef heifers in early pregnancy; however, herbage production was greater for the lower post-grazing sward height.
In contrast, with lactating beef suckler cows, grazing to a lower residual sward height - 4.1 vs. 5.3 cm - resulted in lower cow live weight gain at pasture (although this was not evident post-housing, implying gut-fill effects) and lower cow body condition score gain to post-housing. Milk yield did not differ significantly between grazing treatments. Calf live weight gain was lower, both at pasture and to post-housing, for the lower post-grazing sward height.
- Compared to suckler cows (and calves) which remained indoors (IF), early turnout to pasture in spring, via restricted (6 hours daily: cows only - RG) or full-time (cows and calves - FG) grazing, resulted in lower cow live weight loss to the end of the dietary treatment period (but not subsequently, implying gut-fill effects) for IF compared to both RG and FG, and a higher milk yield for FG than RG and IF, which did not differ. Calf live weight gain to the end of the experimental dietary period was greater for FG compared to IF, with RG being intermediate, but live weight gain to weaning did not differ significantly between treatments. Herbage yields were lower in subsequent grazing rotations for early-grazed compared to later-grazed swards.
Although early turnout to pasture in spring only resulted in transitory benefits in animal performance, replacement of more expensive feedstuffs with cheaper produced grass (and reduced slurry handling) means significant cost savings.

5. Opportunity/Benefit:

- Suckler beef farmers have opportunities to select their replacement heifers from either the dairy herd or from within the suckler herd; crossbred beef breed cows with good maternal traits can achieve an

almost comparable performance to the Limousin x Holstein-Friesian.

- Early turnout to pasture in spring with beef suckler cows, via restricted or full-time grazing, is a strategy to reduce costs associated with the winter housing period without having a negative impact on cow or calf performance. Where full-time turnout to pasture is not practical, restricted grazing can be an effective alternative to overcome this.

6. Dissemination:

- Scientific, technical and popular press articles.
- Research Open Days:
 - 15 June 2010: "Suckler Beef Open Day: Achieving a gross margin of €1000/hectare: Derrypatrick Herd"
 - 15 June 2011: "Suckler Beef: Achieving a gross margin of €1000/hectare: Derrypatrick Herd"
 - 29 September 2011: "Derrypatrick Update Day"
- Presentations at scientific and technical meetings, agricultural advisory personnel training days, Teagasc beef farmer meetings.
- Visiting groups, including beef farmers, beef cattle breeders, agriculture students and agricultural advisory personnel.

Main publications:

McGee, M., Minchin, W. and O'Riordan, E.G. 2011. 'Performance of beef suckler cows and growth of their calves where grass is grazed to contrasting residual sward heights', *Advances in Animal Biosciences, Proceedings of the 8th International Symposium on the Nutrition of Herbivores*, Cambridge University Press, ISNH8, Aberystwyth, Wales, UK, p398.

Gould, N., Minchin, W., Kenny, D.A., Fahey, A.G. and McGee, M. 2011. 'Effect of initial grazing date in spring, via restricted or full time grazing, on intake and performance of primiparous beef suckler cows and their progeny', *Proceedings of the Agricultural Research Forum*, Tullamore, 14 and 15 March 2011, p152.

Minchin, W. and McGee, M. 2011. 'Pre-partum intake and performance of beef suckler cow breed types and pre-weaning growth of their calves', *Proceedings of the Agricultural Research Forum*, Tullamore, 14 and 15 March, p50.

7. Compiled by: Dr. Mark McGee