



Derrypatrick Open Day

Grange Beef Research Centre
Wednesday 11 September 2013

Animal & Grassland Research and Innovation Centre



Biosecurity, Health and Safety

In the interest of safety and disease bio-security, visitors to the Grange Open Day are asked:

- To use disinfection footbaths provided (on entering and leaving the event)
- Park in designated areas
- Stay on the Open Day route
- Not enter fields/paddocks/pens which contain cattle
- Not to handle cattle



Contents

1. Management and performance of the Derrypatrick herd in 2013.
2. Performance of the yearling and finishing animals in the Derrypatrick herd.
3. Financial aspects of the Derrypatrick herd
4. Feeding options for the upcoming autumn/winter
5. Management and performance of the New Maternal Index herd
6. Land drainage on the Derrypatrick unit

Management Details

▪ Turnout to pasture:

- Cows turned out Feb
- Weanlings turned out in Mar but were re-housed
- Heifers and steers returned to pasture in May
- Bulls remained indoors



▪ Grass growth:

- Poor pasture growth in Spring
- Cows were supplemented with 2 kg concentrates at pasture in March & April

▪ Silage area:

- 26 hectares in first cut (%)
- 21 hectares in second cut (%)
- 9.5 hectares surplus grass



▪ Reseeding and drainage:

- ~4 km of drainage work was carried out in August (aiming to improve 8 hectares)
- 10.5 hectares was reseeded

Pasture Management

Aim:

Pre-grazing herbage yields = 1400 -1600 kg DM/ha (10-12 cm)

Post-grazing 4 cm



Consequences of poor pasture growth/ weather conditions:

Early housing last winter

Prolonged indoor period for weanlings last spring

Challenges/ difficulties

- Early weaning and housing last winter
- Late turnout for yearlings this spring (mid-May)
- Lower carcass weights achieved from bulls than previous years

Positives this year

- Greater weaning weights
- Improved reproductive efficiency
- Adequate silage made to cover the winter period
- Drained and reseeded land



Update on the Derrypatrick herd



COW PERFORMANCE

	LIM× FR	LIM× SIM	CH× SIM	CH× LIM
Number (n)	22	17	18	17
Mean calving date	Mar 4	Mar 11	Feb 25	Mar 1
Live weight at calving	580	630	656	667
BCS at calving	2.44	2.56	2.50	2.61
Calving score	1.69	2.53	1.72	1.62
<u>Calf performance (kg)</u>				
Birth weight	47	49	48	50
Current weight	255	227	241	232
ADG (kg/day)	1.22	1.11	1.11	1.05

REPRODUCTIVE PERFORMANCE

	LIM× FR	LIM× SIM	CH× SIM	CH× LIM
BCS at breeding	2.53	2.67	2.71	2.80
CSI (days)	81	77	78	75
CCI (days)	86	80	79	88
Submission rate (21days; %)	44	55	77	74
Pregnancy rate to first service (%)	75	85	85	63
6 week in-calf rate (%)	72	89	95	83
In-calf rate (%)	91	94	95	94
No. of services per cow	1.23	1.21	1.48	1.42
Expected calving date 2014	Feb 27	Feb 22	Feb 14	Mar 3

Carbon footprint – good reproductive and live weight performance are critical factors.

Derrypatrick Herd: Post-weaning progeny performance

Winter Diet:
Grass silage +
1.5 kg Concentrate/d

Live weight (kg)

Weaning

Housing (Nov 8)

Turnout (May 15)

Grazing (June 5)

(Aug 28)

Average daily gain (kg)

1st winter

June 5–Aug 28

HEIFERS

Dam Breed Type

LIM×FR

LIM×SIM

CH×SIM

CH×LIM

287 277 271 232

292 281 276 240

364 347 347 304

373 365 364 317

454 445 442 390

0.38 0.39 0.35 0.34

0.97 0.96 0.93 0.87

STEERS

Dam Breed Type

LIM×FR

LIM×SIM

CH×SIM

CH×LIM

317 270 275 280

321 272 280 286

411 368 356 369

410 374 360 372

507 464 451 461

0.48 0.51 0.41 0.44

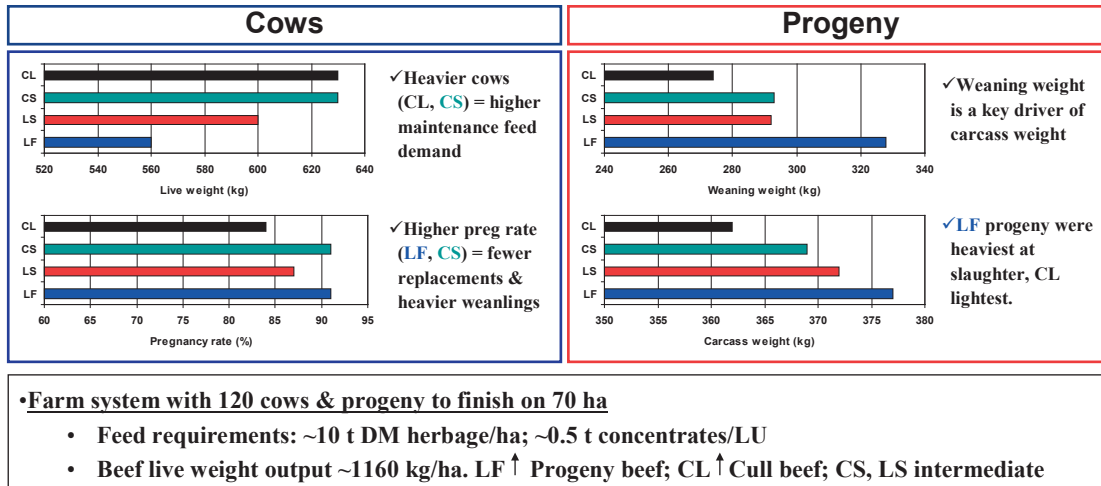
1.18 1.07 1.08 1.06

Derrypatrick Herd: Post-weaning progeny performance

	BULLS				DIET
	<u>Dam Breed Type</u>				
	<u>LIM×FR</u>	<u>LIM×SIM</u>	<u>CH×SIM</u>	<u>CH×LIM</u>	
<u>Live weight (kg)</u>					<u>First Winter</u>
Weaning	293	278	293	255	Grass silage to appetite + 2.0 kg concentrate/day
Housing (Nov 8)	299	280	297	249	
Finishing (May 15)	417	371	403	375	<u>Finishing Period</u>
(Aug 28)	694	616	615	603	Concentrates ad libitum + Grass silage (restricted)
<u>Average daily gain (kg)</u>					
1 st winter	0.63	0.48	0.56	0.67	Bull slaughter & carcass data will be presented at the Open Day
Finishing (May 15–Aug 28)	2.21	2.33	2.02	2.17	

Breed Cow Comparison of the Derrypatrick Herd

Physical Performance



	Limousin X Hol-Fries (LF)		Limousin X Sim-mental (LS)		Charolais X Sim-mental (CS)		Charolais X Limousin (CL)	
Progeny of mature cows	Male	Fem	Male	Fem	Male	Fem	Male	Fem
Weaning weight (kg)	340	315	304	280	304	281	273	274
Slaughter weight (kg)	717	606	691	585	699	589	656	571
Killing out rate (%)	59.6	54.2	60.4	56.1	60.0	54.3	60.3	56.7
Carcass weight (kg)	425	328	417	327	418	319	398	325
Live weight per day of age (kg)	1.24	1.00	1.20	0.96	1.21	0.97	1.14	0.94
Carcass conformation (1-15)	U=	R=	U=	R+	U=U+	R=	U=U+	R+
Carcass fat (1-15)	2+	3=	2+	3=	2+	3=	2+	3=

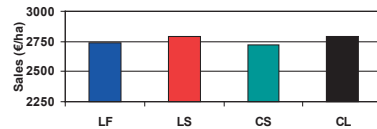
Cow				
Live weight post calving (kg)	560	600	630	630
Pregnancy rate1	0.91	0.87	0.91	0.84

System2				
Average cow numbers	109	106	109	103
Herbage utilised (t/ha)	10.3	9.9	10.0	9.7
Concentrates fed (kg/LU)	559	542	538	540
Progeny output (kg carcass/ha)	604	596	591	578
Cull output (kg carcass/ha)	56	77	63	93

1Number of cows pregnant as a percentage of cows bred. 2Assuming 120 cows calving on 70 ha for each breed type.

Financial Performance & Sustainability

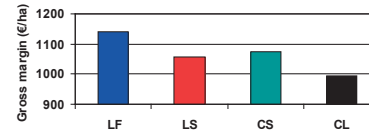
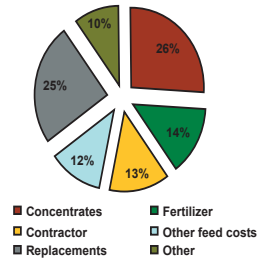
Output, costs and gross margin (@ 2012 prices)



• Total sales similar for all systems, but

- Progeny beef: LF > LS > CS > CL
- Cull beef: CL > LS > CS > LF

Production costs breakdown



• Gross margin ~€1,000/ha for all systems

• Net margin ~€600/ha

- LF > CS > LS > CL

• Production systems must be sustainable so that current practices do not undermine future potential

- Carbon footprint – research farm systems 20% lower than national average
- Nutrient efficiency – optimise use of slurry and fertilisers; clover at lower stocking rates

	Limousin X Hol-Friesian (LF)	Limousin X Simmental (LS)	Charolais X Simmental (CS)	Charolais X Limousin (CL)	Average
Progeny beef sales	2,539	2,522	2,502	2,458	2,505
Cull beef sales	198	271	223	330	255
Less heifer purchases	306	473	370	549	424
Gross output	2,431	2,327	2,355	2,253	2,341
Variable costs					
Concentrates	460	447	442	447	449
Fertilizers	250	238	245	233	241
Contractor	211	213	219	210	213
Other feed costs	208	206	211	202	207
Other variable costs	162	166	162	169	164
Total Variable costs	1,291	1,269	1,279	1,260	1,275
Gross margin	1,140	1,057	1,075	993	1,066
Gross margin (2013 prices)	1,202	1,149	1,146	1,095	1,148
Net margin	630	549	569	484	558
Net margin (2013 prices)	692	640	640	586	640
IEconomics are based on prices in 2012 (final year of “Phase 1” of the Derrypatrick Herd): Beef price (R3), €4.05/kg carcass. Concentrates, €350/t. Urea, €400/t. CAN, €310/t. Gross and net margins are also given for 2013 prices.					

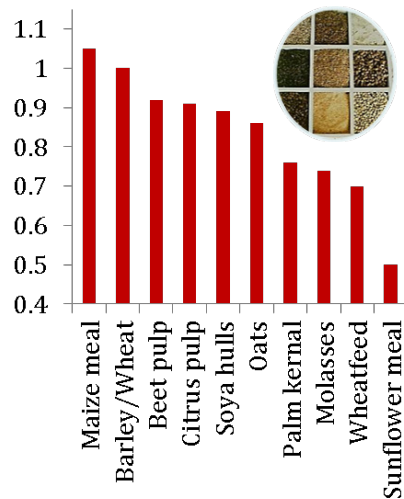
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	2011	2012
Output		
Progeny beef sales	2,133	2,424
Cull sales	404	757
Total sales	2,537	3,181
Heifer purchases	270	5181
Inventory change	46	-6292
Gross output	2,313	2,035
Variable costs		
Concentrates	385	5793
Other feed	501	4324
Vet/med	198	102
Other	76	71
Total variable costs	1,160	1,183
Gross margin	1,153	851
Estimated fixed and overheads	539	652
Net margin	614	199

1Heifer purchase prices increased considerably in 2012 relative to 2011. 2The negative inventory change in 2012 was due to a lower than anticipated pregnancy rate (82%) following a very difficult summer. This was partially offset by higher cull sales. 3Higher concentrate feeding due to longer indoor feeding periods for finishing cattle. 4Purchased forage costs were offset by a substantial reduction in silage contractor costs due to a smaller area harvested in 2012.

Feed Options for Finishing

Energy Feeds (UFV)



Before Choosing a Diet...

1. Target carcass weight & composition
2. Target daily gain
3. Length of finishing
 1. Ad lib feeding
 1. Bulls ~ 100-120 days
 2. Steers ~ 90-100 days
 3. Heifers ~ 80-90 days
4. Forage quality

Ration Specification

High Energy 0.92-0.94 UFV
 Low protein 11-12%
 Minerals & Vitamins

Sample Rations

Grange Mix (0.96 UFV)		%
Barley		87.5
Soya		6.75
Molasses		4.75
Minerals		1.5
Kildalton Mix (0.94 UFV)		%
Barley		57.5
Soya hulls		12
Distillers grains		23
Molasses		5
Minerals		2.5

Suckler Cow Feeding

Spring Calver

72 DMD

65 DMD

60 DMD

Restricted silage

Silage Required

Restricted (80% of intake)

Fed to appetite

To appetite + 0.5-1 kg meals

20 kg silage + 3.0 kg meals

Autumn Calver (Pre-mating)

72 DMD

66 DMD

60 DMD

Ad lib silage +1.8 kg meal

Ad lib silage +2.5 kg meal

Ad lib silage +3.0 kg meal

Consider cow condition + mineral supplementation



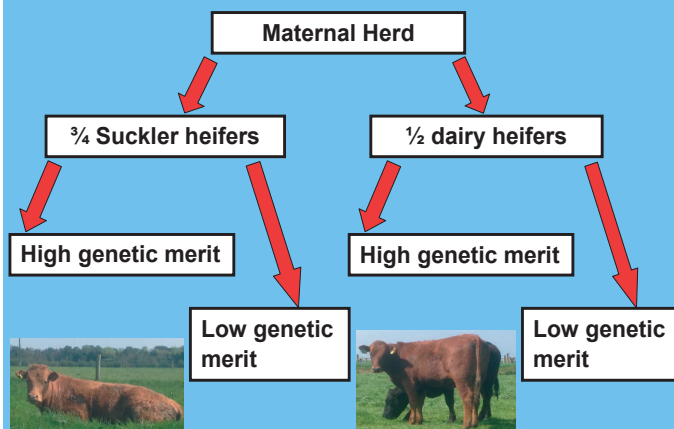
Feeding Weanlings

DMD	Poor (62%)	Average (68%)	High (72%)
ADG = 0.6 kg	2.5	2.0	1.0

1. Feed meals pre-housing
2. Minimum gain needed to avoid stunting growth ~ 0.25 kg ADG
 1. The feeding rates above can be reduced by 0.5-1.0 kg for 0.4 kg LW gain, which may be adequate IF animals are turned out early
3. Batch weanlings – target higher meal feeding rates at lighter animals.
 1. Don't over-rely on compensatory growth
 2. Early turnout is as critical as meal feeding

Maternal Index

Objective: To validate the new Maternal index



Future Measurements

Milk yield	Live weight & BCS
Reproduction & Survival	Grass Intakes

Heifer Performance (Preliminary)

	Dairy Cross		Suckler Cross	
Genetic Merit	High	Low	High	Low
Maternal Index (€)	206	155	150	106
LW (kg)	435	411	464	476
BCS	2.64	2.69	2.80	2.86
ADG (kg/d)	0.91	0.92	0.78	0.80
6 week in calf (%)	46	53	44	37
In calf (%)	96	100	88	81
Approx calving date	20/03	10/03	21/03	15/03

Age at first calving is an important factor influencing the carbon footprint of beef

Land Drainage Design

James O'Loughlin & Owen Fenton



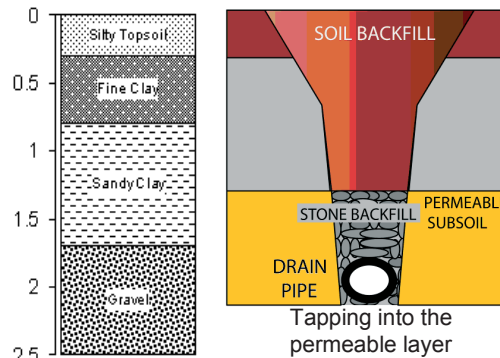
Problem Diagnosis



Soil Test pits (at least 2.5m deep)

- Is it a ground water or shallow drainage problem?
- Water enters in permeable layers
- Other layers impermeable

Ground Water Drainage System



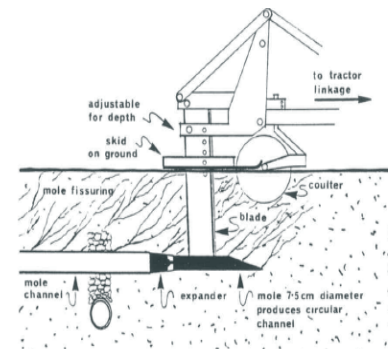
Conventional or deep pipe drains:

- Where a permeable layer will transmit water
- Where water can percolate to watertable
- Most effective way to discharge water

Shallow Drainage System

Mole or Gravel Mole drain:

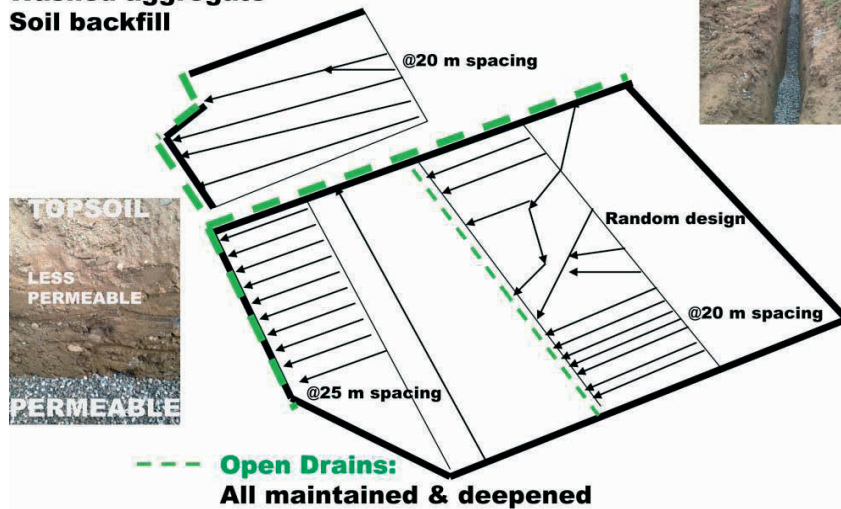
- Aim to fracture and crack the soil
- Effectiveness Dependent on:
 - Soil Clay Content (>40%)
 - Implement Used
 - Weather Conditions
- Used In tandem with collector drains



Grange Land Drainage Design and Costs

Groundwater Drainage Design Installed to Control the Water Table:

**1.6 m approx depth
Washed aggregate
Soil backfill**



Cleaning existing open drains and remove spoil	80 hours @ €50 per hour	€4,000
Installation of 1.6 m deep drains, supply pipe and stone	3,884 metres @ €8 per metre	€31,072
Full grass reseed	10.5 Ha @ €600 per Ha	€6,300
Total		€41,372 €3,940/Ha €1,595/acre



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