



Simulation model of dairy calf to beef production systems

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Outline

- Objectives
- What is a dairy calf-to-beef system?
- Description of Grange Dairy Beef Systems Model (GDBSM)
- Model application and results
- Summary



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Objectives

- Develop model of grass based dairy calf-to-beef systems
- Technical and economic evaluation of these systems
- Identify financially viable systems
- Investigate effects of technical, market & policy changes



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Dairy calf-to-beef system



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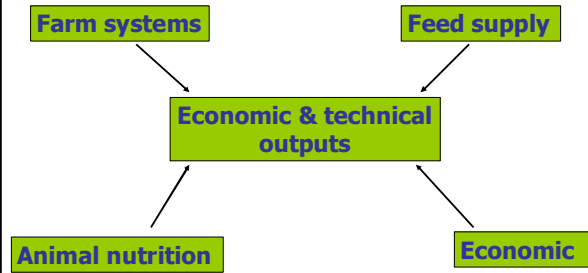
Description of GDBSM

- Whole farm, single year, static, deterministic, simulation model
- Bioeconomic model: biological and physical system components simulated to permit an economic appraisal of performance
- Budgetary simulation approach developed in Excel
- Production coefficients primarily from published research data from Teagasc, Grange



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GDBSM structure



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Farm systems



LW & LWG



Animal numbers



Nutrient management



Housing



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Animal nutrition (using net energy system)

Breed, LW & LWG



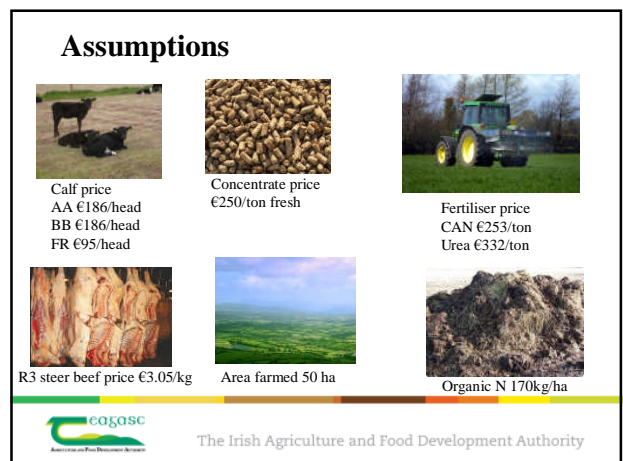
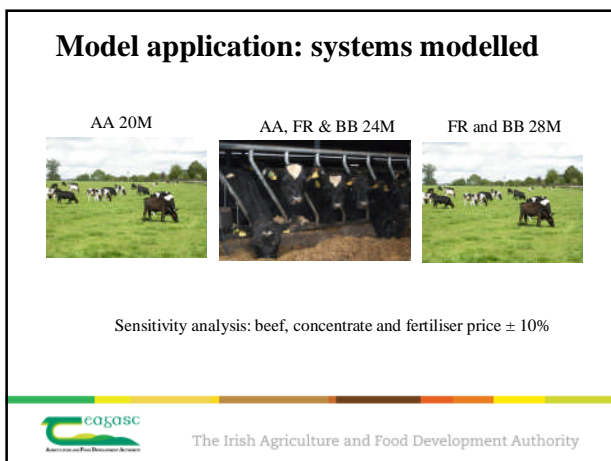
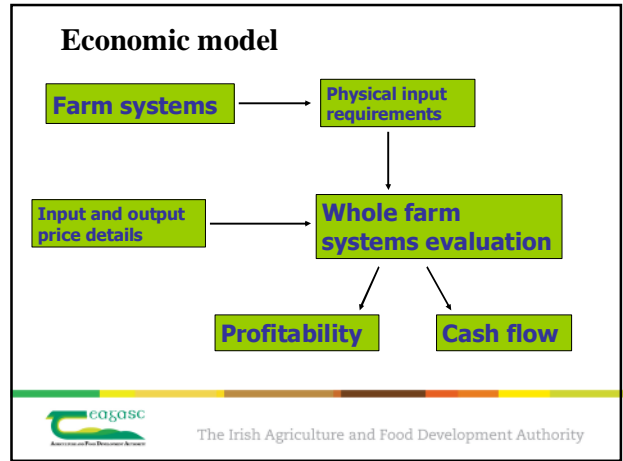
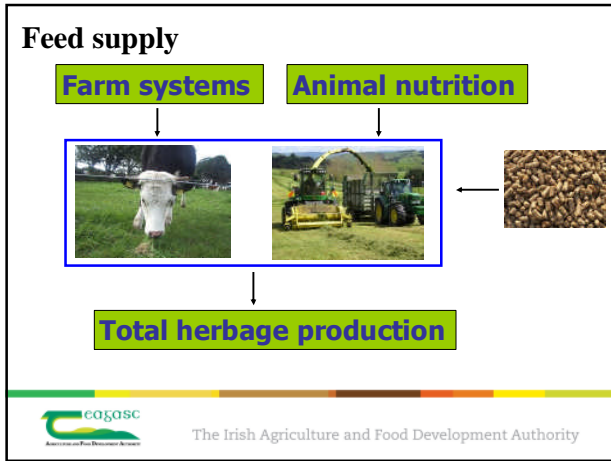
Energy demand and intake capacity




Total grazed grass, grass silage & conc. demand




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Physical results						
Scenario	AA		FR		BB	
	20	24	24	28	24	28
Age slaughter (months)	20	24	24	28	24	28
Grazing area (ha)	37	19	18	24	17	20
Silage harvest (ha)	13	32	32	27	33	30
Grazed grass % of total diet	73	52	52	67	51	64
Grass silage % of total diet	14	32	31	26	32	30
Concentrate % of total diet	13	16	17	7	17	6

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Physical results continued						
Scenario	AA		FR		BB	
	20	24	24	28	24	28
Age slaughter (months)	20	24	24	28	24	28
Inorganic N applied (kg N ha ⁻¹)	80	86	89	108	90	100
Number animals finished (head)	140	103	103	81	103	81
Liveweight output (kg ha ⁻¹)	1369	1230	1232	1054	1290	1093
Carcass output (kg ha ⁻¹)	752	664	662	580	724	627

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Financial results (€'000/farm)						
Breed	AA		FR		BB	
	20	24	24	28	24	28
Age	20	24	24	28	24	28
Gross output	74.9	78.7	86.0	78.0	91.0	81.4
Variable costs	44.9	53.2	56.6	39.4	55.8	38.8
Gross margin	30.0	25.5	29.4	38.6	35.2	42.6
Fixed costs	31.8	30.5	29.9	30.0	30.5	30.6
Net margin	-1.8	-5.0	-0.5	8.6	4.6	12.0

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Price change effect on net margin (€'000/farm)						
Breed	AA		FR		BB	
	20	24	24	28	24	28
Age	20	24	24	28	24	28
Beef price (+/- 10%)	10.3	9.9	9.7	8.6	11.2	9.8
Fertiliser price (+/- 10%)	0.4	0.4	0.4	0.6	0.4	0.5
Concentrate price (+/- 10%)	1.8	2.2	2.6	1.1	2.4	1.0

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Summary

- Model of grass based dairy calf-to-beef systems
 - Permits technical and economic evaluation of dairy calf-to-beef systems
- Application of GDBSM
 - BB steers slaughtered at 28 months most profitable
 - Maximise proportion grazed grass in diet
 - All systems very sensitive to beef price changes



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