

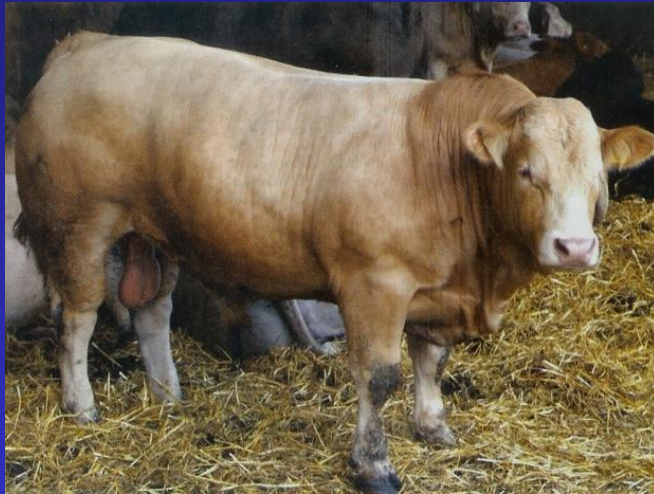


Harper Adams
University



Harper Adams
University

Intensive Beef Production



Simon P Marsh

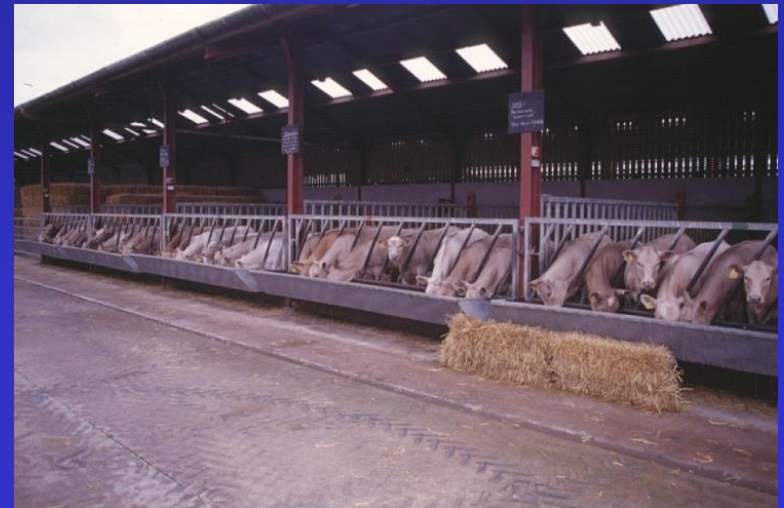
Principal Lecturer – Beef Cattle Specialist
& NBA Board Director

Email: smarsh@harper-adams.ac.uk

(Presentation © S P Marsh)

How a farms resources determine the choice of production system

- Feed availability, quality & quantity i.e. cereals, grass, co-products
- Building suitability for calf rearing, store cattle or bulls
- Machinery, silage clamp capacity and handling facilities
- Market requirements
- Breed type
- Labour availability
- Capital availability
- Systems are either:
 - Intensive (12-16 months)
 - Semi-intensive (18-20 months)
 - Extensive (24-30 months)



Intensive Beef Production Systems

- Cereal Beef
 - Barley
 - Co-products
- Silage Beef
 - Maize silage
 - Grass silage
 - Whole crop



Cereal (barley) Beef

- The 'simplest' of all the various beef production systems, developed in the 1960's. No land theoretically required but some needed for manure
- Cattle housed throughout their life and fed a high energy ration *ad lib*. Slaughtered at 12-15 months old
- The system is especially suitable for LATE MATURING breed types i.e. Bulls, Continental crosses and Holsteins. Why is the system NOT suitable for early maturing breed types?



- Heifers and early maturing beef breed types reach slaughter condition (fat class 3-4L) at light weights (400-450kg [210-240kg deadwt])
- Cereals (rolled barley) mixed with a protein concentrate OR soyabean/rapeseed meal and minerals fed *ad libitum*
- From 3 to 6 months of age the cattle are typically fed a diet of 85% rolled barley and 15% protein concentrate. This is a high energy diet (12.5ME [MJ/kg DM]) with a crude protein (CP) content of 14%
- The target weight is 250 kg at 6 months



- At 6 months old the cattle have a diet of 90% rolled barley and 10% protein concentrate to provide a diet containing 12% CP
- Offer straw or silage *ad lib* (intakes are approx 0.75 and 5kg/h/d respectively) to minimise problems with bloat
- Cereals must be 'lightly rolled' (not ground) and feed hoppers never allowed to become empty to minimise problems with acidosis
- Cattle must be housed in well-ventilated buildings



- Overall target DLWG from 12 weeks to slaughter is 1.3-1.4kg and Feed Conversion Ratio (FCR) of ~5:1
- Carcasses have white coloured fat. Beef from bulls does not have 'a taint'. Bulls must be finished under 16 months old – why?
- Gross margins easily predicted and sensitive to the relative price of the calf, cereals and finished beef price
- Good cash flow/turnover

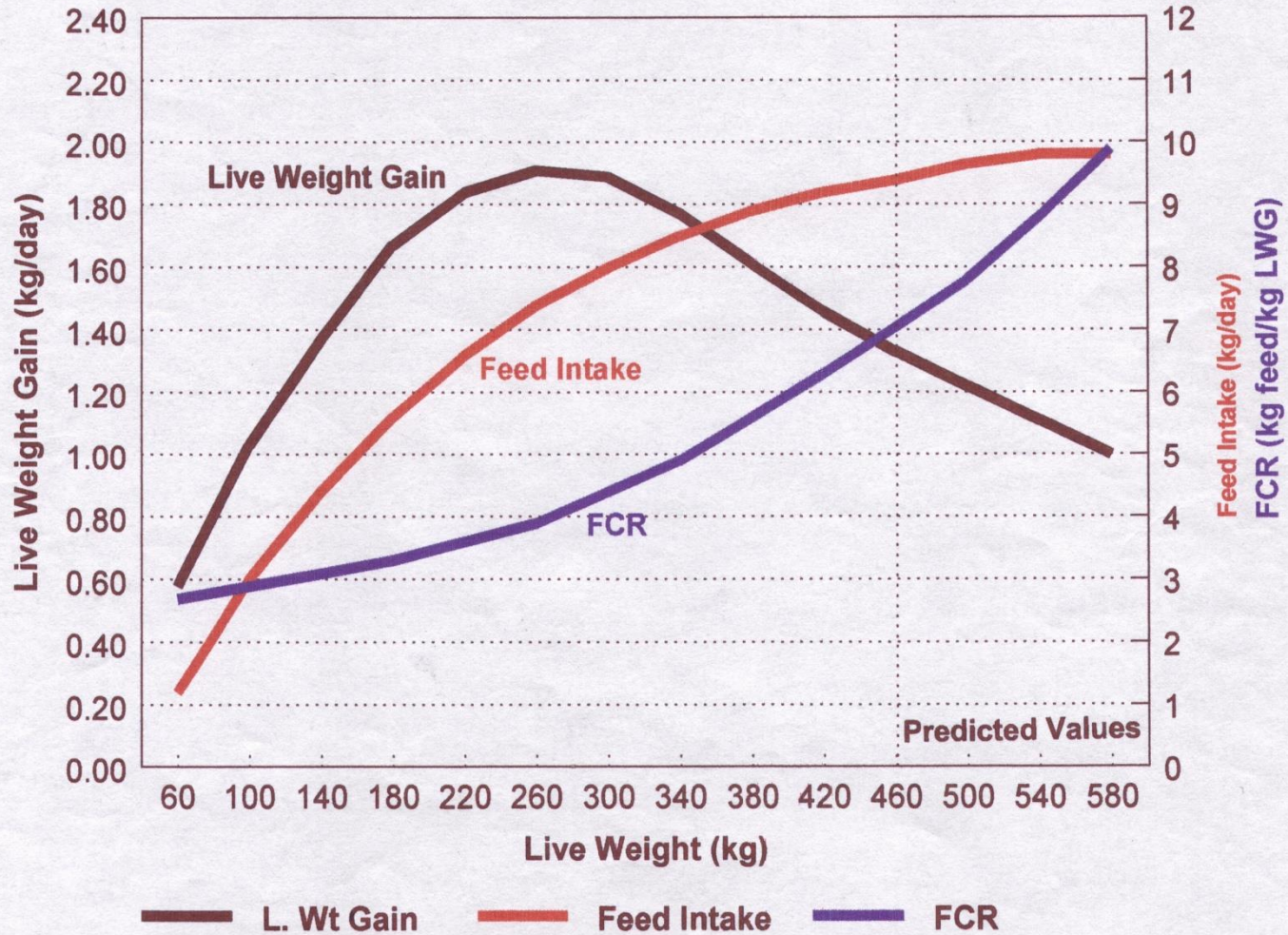


Cereal Beef targets for dairy-bred calves

	Holstein Bull	Continental x Holstein Bull
Slaughter (mo)	14	14
Slaughter wt (kg)	560	600
DLWG from birth (kg)	1.22	1.31
DLWG from 12 wks (kg)	1.34	1.40
Carcase wt (kg)	285	335
Daily carcasse gain from birth (kg)	0.66	0.78
Killing out %	51	56
Carcase grade	-O 3	R 3
Concs (t/head)	2.50	2.42
FCR (from 12 wks old)	5.5	5.0

(Adapted from EBLEX 2005. *Beef action for profit: better returns from dairy-bred bulls & EBLEX 2012. Better Returns from Pure Dairy-Bred Male Calves*)

PATTERN OF LIFETIME PERFORMANCE FOR HOLSTEIN BARLEY BEEF BULLS AT LANGHILL



- A number of beef producers, predominantly in arable areas, intensively finish weaned (6-9 month old) suckled bulls and 450+kg store cattle
- Cattle housed and finished in 3-6 months recording DLWG's of 1.4-2.0kg
- Cereal diet needs to be gradually introduced - WHY?
- Many of these beef producers utilise high energy co-product feeds such as brewers grains, Traffordgold, potato & vegetable co-products, reject bread, pot ale syrup, etc..



Advantages of Cereal Beef Production

- Simple and easy to operate
- Animal performance is more predictable compared to forage based systems
- 'Year-round' housing enables bulls to be reared
- Very high (1.3-1.4kg) DLWG's



Bulls v steers v heifers

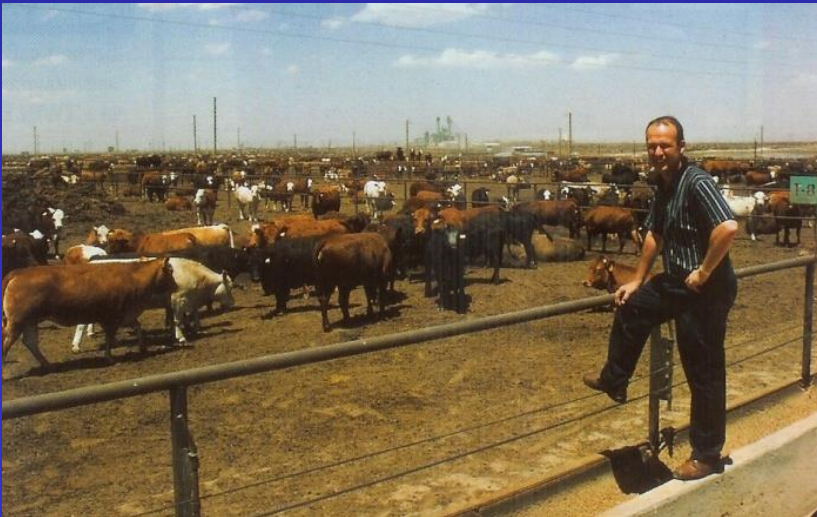
	Bulls	Steers	Heifers
Age at slaughter (mo)	13.8	13.2	13.0
Slaughter wt (kg)	583	534	488
DLWG (kg)	1.44	1.36	1.26
Carcase wt (kg)	317	283	261
Carcase grade	R/-U 4L	R 4L	O+/R 4L/4H
FCR	5.43	5.69	5.81



(HAU Beef Unit - Trial Report 1997a)



- Uniform carcasses with white fat
- Reduced labour due to feeding ease
- Rapid cash turnover (cash flow)
- Farm size does not limit enterprise holding



Disadvantages of Cereal Beef Production

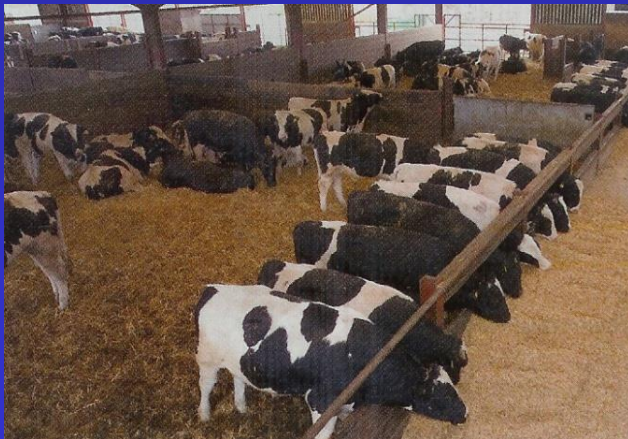
- High level of managerial skills required to minimize digestive and respiratory disorders (i.e. acidosis, bloat and pneumonia)
- Involves a high level of working capital
- Not suited for **EARLY MATURING** breed types i.e. heifers, most British (native) breeds etc.



Gross Margin Sensitivity

- System profitability depends on calf, cereal and beef prices

Component	Change in GM (£/head)
£10 in calf price	+/- 11.7
10p/kg in sale price	+/-29.2
£10/t in concentrate price	+/-24.0
0.1 change in FCR	+/-5.25





Harper Adams
University



Harper Adams
University

January 2018

Harper Adams Beef Unit



Simon P Marsh

Principal Lecturer – Beef Cattle Specialist
& NBA Board Director

Email: smarsh@harper-adams.ac.uk

(Presentation © S P Marsh)

Harper Adams Beef Unit

- 150 cattle finished per year
- Blue & Hereford x Holstein & Holstein calves
- Suckler bred bulls/steers/heifers occasionally purchased
- 2 calf rearing & 2 finishing trials/year
- Bulls were finished at 12-15 months old on either *ad lib* Cereals, Whole crop or Maize Silage (+ concs) & sold dead weight to ABP
- Now changed to a 17-19 month semi-intensive beef system



Harper Adams Beef Unit – new developments

- Sept/Oct born calves are artificially reared, castrated, grazed in the summer and finished 'out of yards' 17-19 months old
- The beef unit recently intensively finished a batch of weaned spring born 360kg South Devon suckler bred steers
- 70 October born Hereford x Fr and Holstein-Friesian steers targeted to finish off grass at 20-22 months old on a 'low cost outdoor forage based system' funded by AHDB, the Hereford Cattle Society and Dunbia
- CIEL funded individual feeders/modernised beef unit

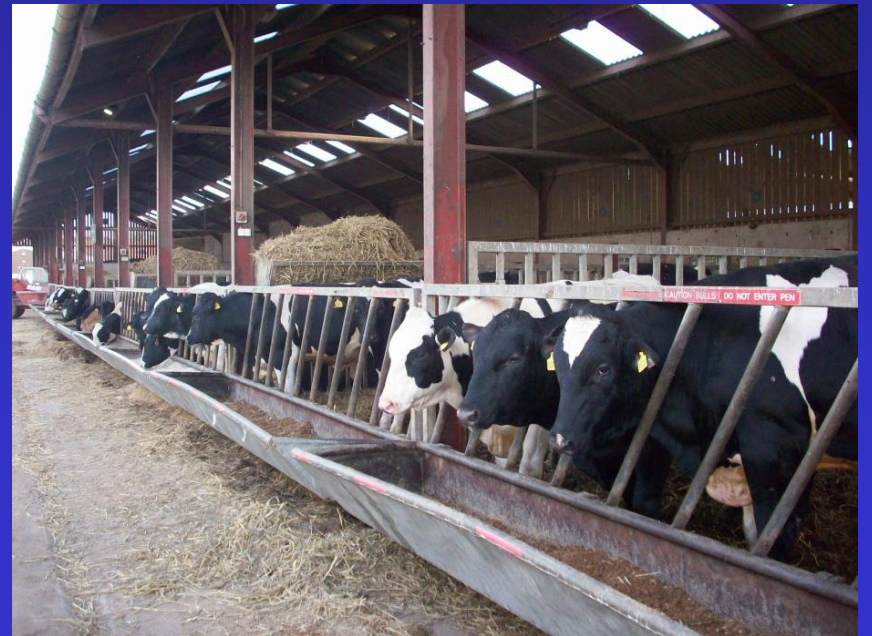




September 2014 – Continental x Holstein bulls on a protein trial and Charolais heifers on a Marine Algae trial



January 2019 – Blue x Holstein steers on a trial to evaluate the replacement of concentrates with whole crop











Sim & Blue x Holstein cereal fed bulls



600kg 7/8th Bred Limousin bulls @ 13 months old



600kg 7/8th Bred Limousin bulls @ 13 months old



575kg British Blue x Holstein Bulls @ 14 months old



475kg British Blue x Holstein Heifers @ 14 months old



$\frac{3}{4}$ Bred Limousin steers @ 11 months old



450kg Holstein bulls @ 10 months old



THE DREADED HOLSTEIN BULL!!!!



THE DREADED HOLSTEIN BULL!!!!

Recent cereal beef performance results from HAU

	Holstein Bulls	British Blue x Holstein Bulls
Slaughter age (months)	13.3	13.1
Slaughter wt (kg)	572	616
DLWG from 12 wks old (kg)	1.43	1.58
Carcase wt (kg)	288	338
Killing out %	50.5	55.0
Carcase DG from birth (kg)	0.71	0.84
Carcase classification	-03	R3
Concentrates (kg/head)	2,737	2,645
FCR (kg feed: kg gain)	5.92	5.28

Beef sires have Easy Calving EBV's with a high Terminal Index

Current beef sires are:

British Blue (AI): Newpole Easy (Genus)

Hereford stock bull: Normanton 1 Leopold (TI +30 – Top 35%)

Intensive Beef Production

- Cereal Beef
 - Barley
 - Co-products
- Silage Beef
 - Maize
 - Grass
 - Whole crop



Intensive Silage Beef

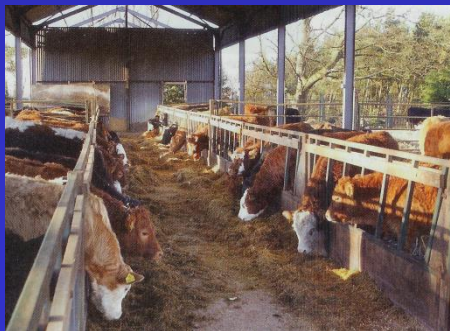
- Intensive indoor system with cattle finishing at 14-16 months old. 'Year-round' housing enables bulls to be reared
- Forages can be maize, grass silage or whole crop
- System particularly suitable for late maturing breed types i.e. Continental x Holstein bulls



- Feeding based on *ad lib* silage plus 3 to 6kg concs/head/day from 3 months of age to slaughter. The quantity of concentrates fed is determined by silage quality
- It is **ESSENTIAL** that good quality silage is fed i.e. well made with a high energy content @ 11.0+ME MJ/kg DM

- **WHY?**

- Overall target DLWG from birth to slaughter is 1.2-1.3kg
- Bulls must be finished under 16 months old



Silage Beef Targets (Bulls)

	Holstein	Continental x Holstein
Slaughter age (months)	15.5	15.5
Slaughter wt (kg)	590	630
DLWG from 12 wks old (kg)	1.25	1.35
Carcase wt (kg)	295	345
Killing out %	50.5	55
Carcase daily gain (kg)	0.62	0.73
Concentrates (t/head)	1.4	1.2
Maize Silage (t/head)	5.5	5.0
Stocking Rate (cattle/ha)*	7.1	7.3

Maize silage @ 36.7/ha @ 30% DM (11t DM/ha)

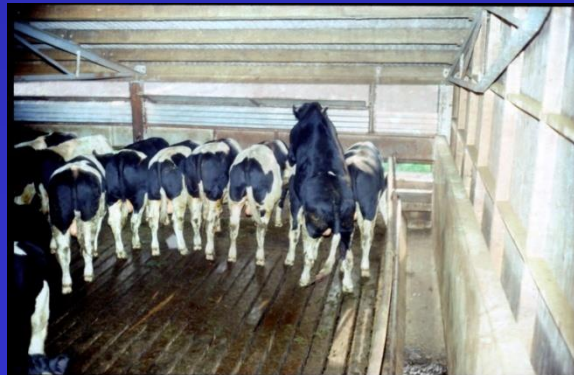


Advantages of Silage Beef Production

- Simple and easy to operate
- Efficient utilization of land (high stocking rates) compared to grazing based systems
- High (1.2-1.3kg) DLWG's
- 'Year-round' housing enables bulls to be reared



- No grazing health problems i.e. gut & lung worms
- ‘Year-round’ production system and ‘encouraging’ cash flow
- High stocking rates can produce higher gross margins per hectare compared to semi-intensive and extensive beef systems
- Lower feed costs compared to Cereal Beef?



Disadvantages of Silage Beef Production

- Weather conditions may affect silage quality, especially grass silage
- Extra buildings may be required i.e. silage clamps
- Possible aerobic deterioration at the silage clamp face in summer
- Bulls must be finished under 16 months old



- Involves a high level of working capital
- Extra labour and machinery is required which raises costs
- More FYM compared to grazing based systems
- System profitability depends on calf, feed and beef prices - 'as per' all beef production systems!



Further Information available on the AHDB website

- Better Returns from calf rearing. AHDB Beef Manual 12 (2017)
- Beef production from the dairy herd. EBLEX Beef BRP Manual 4 (2007)
- Better Returns from Pure Dairy-bred Male Calves. EBLEX Beef BRP Manual 10 (2012)
- Feeding growing and finishing cattle for Better Returns. AHDB Beef BRP Manual 7 (2016)
- The Mini Feeds Directory, EBLEX Better Returns Programme (2008)





Harper Adams
University



Harper Adams
University

Intensive Beef Production



Simon P Marsh

Principal Lecturer – Beef Cattle Specialist
& NBA Board Director

Email: smarsh@harper-adams.ac.uk

(Presentation © S P Marsh)