Organic Beef Production – Sire breed comparison

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Introduction

The Department of Agriculture, Fisheries and Food Organic Farming Action Plan 2008-20 12 stated that it is imperative that growth in the organic sector is market driven. The report also stated that the UK imports 4,000 tonnes of organic beef per year, this translates to a requirement of 14,000 animals. For Ireland to supply the home and UK market it would need 3 times the amount of beef currently produced. Against a background of a shortage of organic beef it is understandable that organic beef currently commands a premium of 20% to 25% over conventional beef.

The opportunity to achieve premium price for organic beef was the driving force behind the decision to constitute an organic suckler herd in Johnstown Castle with the objective of producing quality organic beef and at the same time evaluating the impact of early or late-maturing sire breeds on beef output.

The current experiment location at Johnstown Castle Environmental Research Centre is to determine the effects of sire breed type (Charolais and Aberdeen Angus) on production and meat quality in organic beef production. A 44-cow continental-cross spring-calving herd has been established to produce cross-bred calves. This herd is principally made up of Limousin x and Simmental x cows. This herd is maintained by bringing in mature cow replacements of the same breed type. Using a representative group of bulls from each breed 50% of the cows were bred to Aberdeen Angus and 50% to Charolais. AI was used to the greatest extent possible with two natural service bulls used to ‘mop up’.

The overall plan is to slaughter the progeny of the herd on three dates. In year 1 the first date half the Charolais and half the Aberdeen Angus heifers were slaughtered. At the middle date the remaining heifers were slaughtered as well as half the steers from each breed group and at the final date the remainder of the steers were slaughtered.

The cow/calf herd followed a rotational grazing pattern in a designated area of the farm. The yearling heifers and steers also had a rotational grazing programme on a different land area section of the 60 ha land unit.

The animals were accommodated on straw according to Organic Standards.

Results

Calf and weaning weights

Calf liveweight: In years 1, 2 and 3 the Charolais calves were approximately 8 kg heavier at birth than the Aberdeen Angus calves (Table 1).

Weaning Weight: Performance from birth to weaning was consistent over the three years. In years 1, 2 and 3 the performance of both sire breeds and male and female from birth to weaning was satisfactory, averaging 1.20 kg/day in year 1, 1.00 kg/day in year 2 and 1.05 kg/day in year 3 (Table 1). The growth advantage of the steers over the heifers and that of Charolais over Aberdeen Angus (Table 1) was comparable to that achieved in conventional production systems.

Table 1: Effect of sire breed on calf performance to weaning (kg)

				AA Male
Year 1 (2006)				
Birth wt. (kg)	49	43	54	50
Weaningwt.(kg)	292	275	326	298
Liveweight gain (kg/d)	1.17	1.17	1.31	1.12
Year 2 (2007)				
Birth wt. (kg)	44	39	52	49
Weaning wt. (kg)	264	226	269	264
Liveweight gain (kg/d)	1.02	0.91	1.06	1.04
Year 3 (2008)				
Birth wt. (kg)	46	41	51	49
Weaningwt.(kg)	269	242	289	280
Liveweight gain (kg/d)	1.04	0.94	1.14	1.12

End of 2nd grazing season weight

The liveweight performance of the Aberdeen Angus and Charolais steers and heifers was 535, 534, 512 and 543 kg respectively at the end of the grazing season (October 2007). The corresponding values for 2008 were 514, 519, 453 and 513 kg (Table 2).

Table 2: Effect of sire breed on calf performance to yearling (kg)

	AA		CH	
	Male	Female	Male	Female
Year 1 (2006)				
Birth wt. (kg)	49	43	54	50
Mid-April2007wt.(kg)	348	314	353	359
23rd October 2007	535	512	534	543
Year 2 (2007)				
Birth wt. (kg)	44	39	52	49
Mid-April2008wt.(kg)	357	314	362	345
23rd October 2008	514	453	519	513

Performance of the progeny to the end of the 2nd grazing season was consistent over both years. In both years the liveweight of the steers was in excess of 500 kg for both Aberdeen Angus and Charolais. The key production values achieved for animals born in year 1 are presented in Table 3 and the corresponding values for animals born in year 2 are presented in Table 4.

Table 3: Effect of sire breed and sex on performance of calves born in spring 2006 (year 1)

	AA		**CH**	
	Male	Female	Male	Female
No. of animals	13	9	12	10
Birthwt.	50	43	54	50
06June06	152	124	155	157
21 Nov. 06	338	305	342	344
19April07	348	314	353	359
24Aug07	492	461	477	496
23Oct07	535	512	534	543

Table 4: Effect of sire breed and sex on performance of calves born in spring 2007 (year 2)

	AA		CH	
	Male	Female	Male	F
No.of animals	11	8	12	13
Birthwt.	44	39	52	49
18June07	159	130	151	159
08Nov.07	282	240	290	271
19April08	357	314	362	345
14Aug08	470	410	475	454
23Oct08	513	453	519	502

Carcass data

The slaughter data generated from year 1 of the study (Table 5) shows a 67 kg increase in carcass weight between the early and late slaughter dates for the heifers. The corresponding value for the steers was 44 kg. The data when complete is expected to confirm the expected difference between Aberdeen Angus and Charolais sires.

The late groups of heifers slaughtered responded very well to the additional feeding from October to January when the cold carcass weight increased from 276 kg to 343 kg (Table 5). Similarly, the late groups of steers slaughtered responded well to the additional feeding from January to March when cold carcass weight increased from 344 to 388 kg (Table 5).

Table 5: Effect of different slaughter dates on the performance (kg) of male and female calves born in spring 2006 (year 1)

			Heifers	
	Early	Late	Early	Late
Slaughter date	24 Oct	22 Jan	22 Jan	11 Mar
No. of animals	10	9	13	12
Birthwt.	44	50	50	54
21Nov06	321	330	334	346
24Oct07	522	532	534	535
Final wt. (kg)	522	609	615	688
Carcasswt.(kg)	276	343	344	388
KO%	53.0	55.8	55.9	56.4
Conformation score	3.1	3.4	2.9	2.7
Fat score	3.3	3.3	2.9	3.3

[1]Conformation score: E = 5, U =4, R =3, O=2 and P = 1

Data from the early slaughter heifers groups show consistency between in year 1 and year 2 (Table 6). The Ch x had heavier carcasses compared the Aberdeen Angus x when both were finished off grass. The Ch x also indicate better carcass conformation.

Table 6: Effect of sire breed on carcass characteristics of early slaughtered heifers for year 1 and year 2

	AA		CH	
	2006	2007	2006	2007
No. of animals	5	4	5	6
Finalwt.	505	478	539	530
Carcass wt.	266	252	287	279
KO%	52.8	52.8	53.2	52.8
Conformation score	3.2	3.0	3.0	3.2
Fat score	3.6	3.2	3.0	2.9

Conclusion

The results to date, from this sire breed comparison study indicate that with the contrasting Aberdeen Angus and Charolais sire breeds that is possible to achieve animal performance data comparable to well managed conventional suckler calf to beef systems (300 kg carcass for heifers in Nov and 400 kg carcass for steers in March). Similarly the responses to sire breed type, sex and date of slaughter for the organic beef animals are biologically compatible. Organic beef is produced under organic rules in response to consumer demand for organic product. The organic system contributes to the protection of the environment and animal welfare. “We have not inherited the world from our forefathers we have borrowed it from our children” (Kashmiri proverb).