Irish Cattle Breeding Federation

Irish Cattle Breeding Statistics 2003

Irish Cattle Breeding Federation Society Limited

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Reference Information

Title: Irish Cattle Breeding Statistics 2003
ISSN: 1649-0991
Date of Publication: 13th May 2004
Editor: Andrew Cromie
Printed by: Print Run Limited, Unit 72,
Western Parkway Business Park,
Ballymount, Dublin 12.

Foreword

The purpose of this publication is to provide the cattle breeding industry with accurate information for decision making. Providing such information is in keeping with ICBF's mission of achieving increased rates of genetic improvement in the national herd. By compiling statistics relevant to the main aspects of cattle breeding I believe that organisations and individuals wishing to make investments in the industry can be better informed when making their decisions and thus achieve better returns on their investments.

In compiling this publication we have endeavoured to cover the key elements of successful cattle breeding including the breeding population, performance recording and current rates of genetic improvement.

The support of these organisations in making data available and in compiling relevant summaries is gratefully acknowledged. This co-operation is a most important contribution to assisting the cattle breeding industry achieve greater effectiveness and efficiency.

The data used in compiling these statistics comes from a number of sources including:

- Department of Agriculture and Food
- Herdbook Associations
- Irish Farmers Journal (photos)

This publication includes an increasing number of statistics derived directly from ICBF's cattle breeding database. The database has consolidated data from many sources and is now providing much more accurate information on individual animals. As a consequence, some of the statistics will change to reflect this greater accuracy. Future publications will make ever-greater use of the database as a source of statistics for this publication.

Please contact us with any suggestions you have for improvement or requests for greater detail or further breakdown. You are recommended to also refer to the ICBF website (http://www.icbf.com), where further information is freely available.

Brian Wickham
Chief Executive

Liss Mirt C476

Bred by Messrs B & J McEnroe, Liss House, Oldcastle, Co. Meath
He had an Overall Beef Merit Index of 116 and was purchased
by Dovea AI for €4000.

Simmental

'Carroward Prince'
Top Performance Tested Simmental, March 2004
Bred by Tom Maloney, Carroward, Bohola, Claremorris, Co. Mayo
Purchased by Anthony Harty, Athenry, Co.Galway for €6400

Limousin

'Millbrook Tanko'
Top Performance Tested Limousin, March 2004
Bred by William Smith,Millbrook, Oldcastle, Co. Meath
Purchased by Western Farm Enterprises, Lisnaskea,
Co.Fermanagh for €15000

Other Breeds

'Lisduff Dandy'
Top Performance Tested Angus Bull to ever go through Tully
Bred by Leo McEnroe, Maghera, Virginia, Cavan
Purchased by None-Go-Bye Farm, Skipton, North Yorkshire
for €16000 (record price)

Charolais

'Anneskeagh Ulysses'
Top priced Charolais bull
Bred by Brian Donnelly, Newhaggard, Lusk, Co. Dublin
Purchased by John Devine, Glenelly Road, Omagh, Co. Tyrone
for €9500

Chapter 1 – Identification, Registration and Ancestry
(i) Animal Event Statistics

- *333,785 Animal Event registrations in 2003*
- *82% of births with sire Information*
- *70% of births with calving survey information*

Table 1.1 Trends in Animal Event Registrations (2002 and 2003)

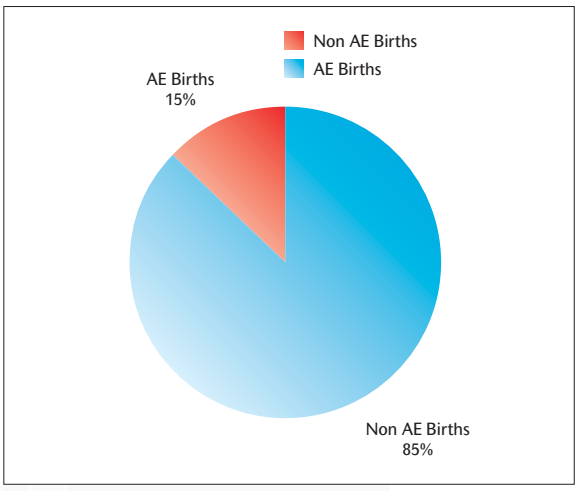
	2002		2003	
	Records	% Total	Records	% Total
Animal Event Registrations	283,967		333,785	
Animal Event - Live Births	268,291	94.5%	317,764	95.2%
Animal Event - Dead at Birth	12,219	4.3%	11,123	3.3%
Animal Event - Abortions	3,457	1.2%	4,898	1.5%
Animal Events Births - Males	142,684	50.9%	167,403	50.9%
Animal Events Births - Females	137,826	49.1%	161,484	49.1%
Animal Event Births - Sheets	243,130	86.7%	271,332	82.5%
Animal Event Births - Emails	37,380	13.3%	57,555	17.5%
Animal Event Births - With Sire	222,236	79.2%	271,054	82.4%
Animal Event Births - With AI Sire	145,599	51.9%	179,162	54.5%
With Calving Survey	215,881	77.0%	228,988	69.6%

The Animal Events system for identification and registration of calf births was first launched in January 2002 (in about 7,000 milk-recorded herds). It has since been extended to pedigree beef herds (a further 6,000 herds started using Animal Events in January 2004) and will be open to all beef and dairy herds as from next year (January 2005).

The objective of the Animal Events system is two-fold; (i) to ensure that farmers meet their obligation with regard to National calf registration, and (ii) that in doing so, they record extra data for cattle breeding (e.g. information on sire identification, calving survey, mortality and pedigree name).

The number of calf births registered through Animal Events in 2003 was 333,785 (Table 1.1). These took place in 7,018 milk recorded dairy herds. The total births occurring in these herds in 2003 (including births from "white-cards") was 415,280 indicating that some 80.4% of the births in these herds were recorded through the Animal Events system.

Fig 1.1 Animal Event Births as a % of Total Births



Expressing the level of births recorded via Animal Events (333,785) as a proportion of the total calf births recorded in Ireland on a national basis (about 2.18 million), suggests that some 15% of the calves born in Ireland in 2003 were registered via Animal Events (Figure 1.1).

Looking at the extent of "extra" data recording through Animal Events indicates that some 82.4% of all births (excluding abortions) had information on the sire of the calf (271,054 births of which 179,162 were by AI sires). In addition some 69.9% of all births have information on the extent of calving difficulty (228,988 records in total).

Fig 1.2 Trends in Animal Event Registration (2002 and 2003)

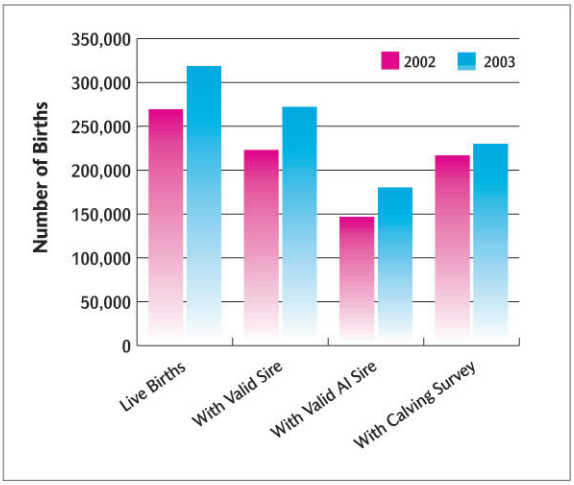
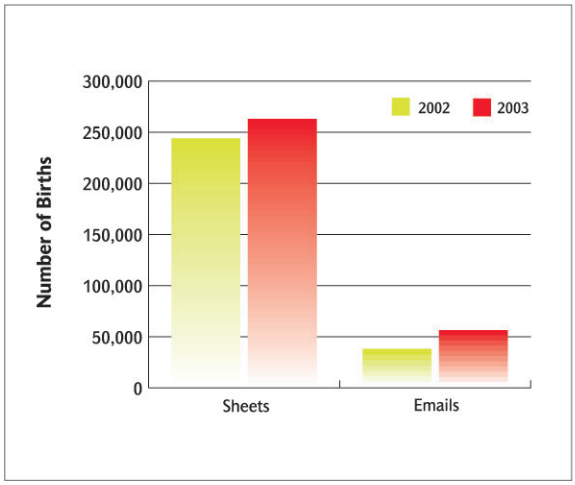


Fig 1.3 Trends in Recording Method (2002 and 2003)



Looking at trends in time (Fig. 1.2) indicates a substantial increase in Animal Event recording in milk-recorded herds in 2003, up from 283,967 in 2002 to 333,785 in 2003 (an increase of some 17.5%). Furthermore, the number of records with valid information of sire ID has increased considerably also, up 21.9% from 222,236 in 2002 to 271,954 in 2003).

Two options are available to farmers in the recording of Animal Events data; (i) via Animal Event sheets or (ii) via approved farm packages (using emails). Of the births recorded via Animal Events in 2003 some 82.5% were recorded via sheets (271,332 in total), whilst a further 57,555 were recorded via emails. Looking at trends in the method of recording for the past 2 years (Table 1.1 and Figure 1.3), indicates a slight increase in the number of herds involved in computerised recording (up some 20,178 registrations compared to 2002).

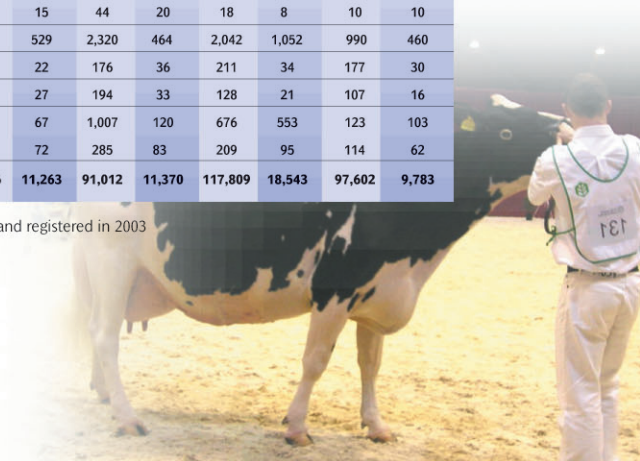
Chapter 1 – Identification, Registration and Ancestry
(ii) Herdbook Registration Statistics

- *29% increase in total herdbook registration in 2003*
- *49% increase in registrations within the IHFA herdbook in 2003*
- *9,783 herd-owners actively involved in herdbook activities*

Table 1.2 Number of Birth Registrations and Members by Breed Society (1997 – 2003)

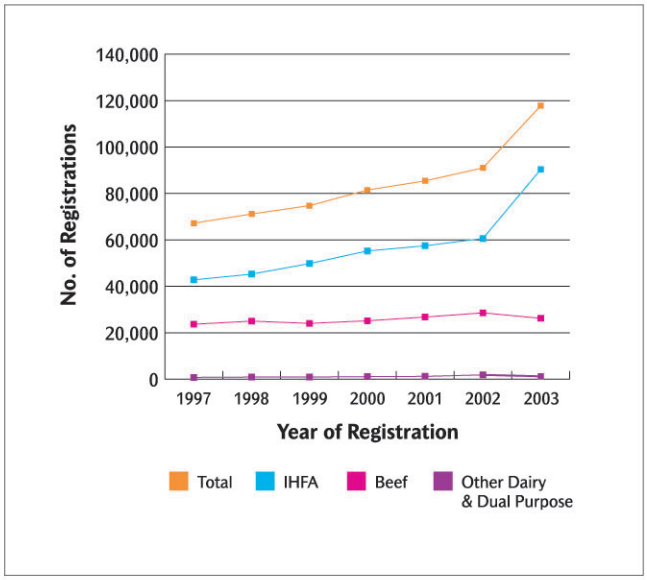
	1997		1998		1999		2000		2001		2002		2003 *			
Herbook Association	Births	Members	Births	Members	Births	Members	Births	Members	Births	Members	Births	Members	Births	Males	Females	Members
Belgian Blue Cattle Breeding Society	389	107	333	127	369	135	420	153	298	184	742	258	215	102	113	178
Jersey Cattle Society of Ireland	175	16	156	14	181	15	124	10	189	13	350	17	97	3	94	7
Irish Aberdeen Angus Association	1,479	351	1,623	379	1,649	376	1,501	356	1,512	439	1,547	445	1,547			445
Irish Angus Cattle Society	-	700	3,011	850	2,236	933	2,200	890	2,300	860	2,600	900	2,652	1,408	1,244	940
Irish Aubrac Cattle Society	-	-	15	10	27	14	78	18	107	21	128	25	147	67	80	29
Irish Blonde d'Aquitaine Breed Co-op Ltd	254	84	187	71	202	78	204	85	208	90	212	90	281	142	139	23
Irish Charolais Cattle Society	7,026	1,941	7,689	2,124	8,402	2,268	9,645	2,524	10,921	2,965	11,343	3,007	9,975	5,229	4,746	2,501
Irish Hereford Breed Society	4,196	826	4,448	861	3,837	892	2,840	730	2,516	735	2,768	598	2,486	1,417	1,069	436
Irish Holstein Friesian Association	42,793	3,435	45,254	3,542	49,797	3,630	55,231	3,342	57,452	3,513	60,593	3,439	90,363	5,002	85,361	3,168
Irish Limousin Cattle Society Ltd	3,379	878	3,762	984	4,306	1,050	5,247	1,474	6,162	1,704	6,586	1,824	6,645	3,410	3.235	1,364
Irish Normande Cattle Society	-	-	129	20	122	21	50	7	85	7	117	11	117			11
Irish Piemontese Cattle Society Ltd	22	13	10	13	37	11	40	12	38	15	44	20	18	8	10	10
Irish Simmental Cattle Society Ltd	3,694	900	3,732	840	2,772	795	2,782	820	2,515	529	2,320	464	2,042	1,052	990	460
Kerry Cattle Society of Ireland	-	-	-	-	135	90	146	101	108	22	176	36	211	34	177	30
Meuse Rhine Issel Cattle Society	145	71	126	74	91	80	209	23	255	27	194	33	128	21	107	16
Montbelliard Cattle Society	174	-	353	-	390	83	559	65	570	67	1,007	120	676	553	123	103
Saler Cattle Society	-	30	-	42	-	55	195	65	180	72	285	83	209	95	114	62
Total	**63,726**	**9,352**	**70,828**	**9,951**	**74,553**	**10,526**	**81,471**	**10,675**	**85,416**	**11,263**	**91,012**	**11,370**	**117,809**	**18,543**	**97,602**	**9,783**

* Statistics for beef herdbooks may be slightly underestimated due to having only information on animals born and registered in 2003



A total of 117,809 calves were registered with 17 different herdbooks in Ireland in 2003 (Table 1.2). This represents an increase in total herdbook registrations of 26,797 (up some 29.4% compared to 2002). The number of herds involved in herdbook activities in 2003 was 9,783, which represents about 10% of the total cattle breeding herds in Ireland.

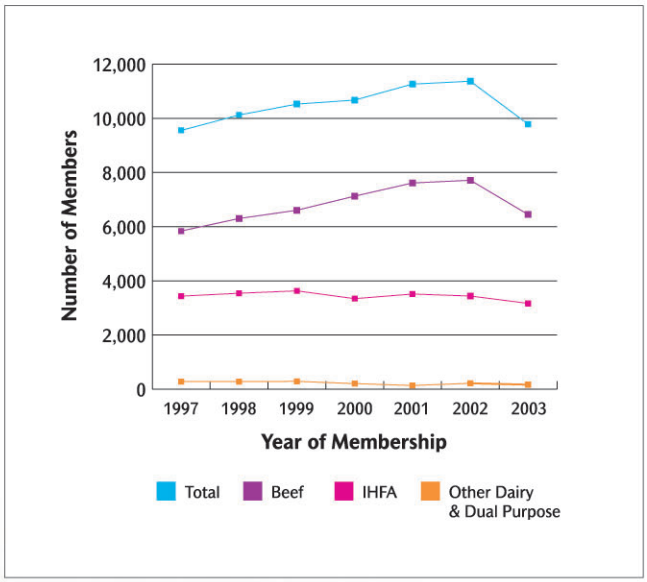
Fig 1.4 Trends in Herdbook Registrations (1997 – 2003)



The increase in herdbook registrations has happened almost exclusively within the Irish Holstein Friesian herdbook, whose registrations increased from 60,593 in 2002 to 90,363 in 2003 - an increase of some 29,770 (up 49.1%). The Holstein Friesian herdbook was the first herdbook to move to the Animal Events system in January 2002, and whilst the improvements in total registrations were only modest in that year (up 6% compared to 2001), the improvements in 2003 were dramatic. A large proportion of the increase in 2003 has been due to "grade-ups" (some 30,977 animals were graded-up to pedigree status in 2003), an aspect of herdbook activity that has been made substantially easier due to the move to the integrated cattle-breeding database.

In contrast, the trends for beef herdbooks have stayed relatively constant or dropped slightly in the past 12 months (beef herdbooks only moved to the Animal Events system in January 2004). Of the beef herdbooks registering calves in 2003, the Charolais society was the largest (9,975 of total 117,809 animals registered in 2003), followed by the Limousin society (6,645 animals registered), the Irish Aberdeen Angus Association (2,652 animals registered) and the Hereford society (2,486 animals registered).

Fig 1.5 Trends in Herdbook Membership (1997 – 2003)



Looking at trends in herdbook activities over the past 7-year period (Figure 1.4 and 1.5) indicates a marked increase in herdbook registrations over that period from a low of 63,726 registrations in 1997 to 117,809 in 2003 (an increase of some 85%). This increase is due largely to the increased activity within the IHFA herdbook, with the rate of increase being somewhat smaller for the beef and other dairy/dual purpose breeds. In contrast, trends in herdbook membership would appear to be on the decline, especially in more recent years (down from 11,370 in 2002 to 9,783 in 2003). However, this is most probably due to a change in the "definition" of member within the cattle-breeding database, which counts the number of "active" members, i.e, those having registered calves during the relevant period in question.

Chapter 1 – Identification, Registration and Ancestry
(iii) Breed Combinations

Breed combinations indicate the extent of "pure-breeding" and "cross-breeding" within the National dairy and beef herds (Table 1.3). The number of calves with both a Holstein Friesian sire and dam in 2002 (data for 2003 is not yet available) was 513,652, suggesting that some 20% of the female calves born to this breed were registered in the Holstein Friesian herdbook (in many European countries such as Holland and Germany this figure is closer to 80%).

Table 1.3 Breed Combination of Calves (2002)

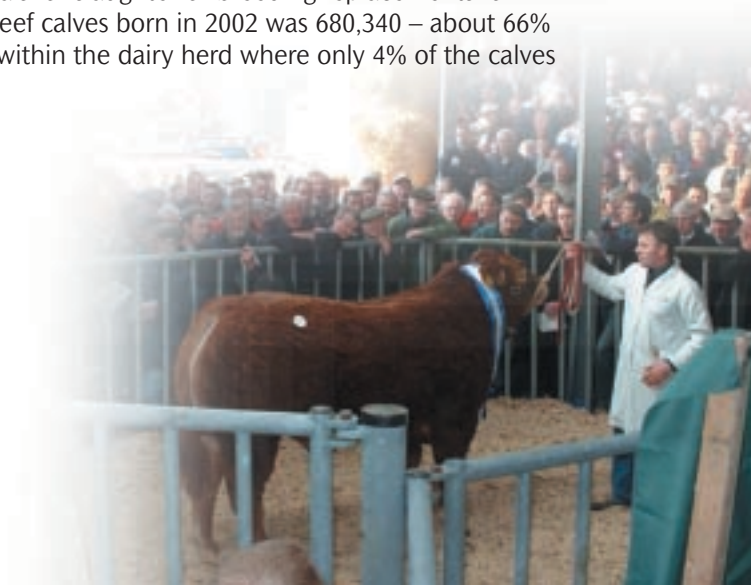
		Dam Breed														
		HF	HE	CH	SI	LM	AA	BA	BB	JE	MO	RW	SA	SH	Other	Total
Site Breed	HF	513,652	1645	513	1468	922	990	15	481	357	1252	942	6	399	442	523,084
	HE	127,985	34,507	4,987	5,925	5,805	4,791	105	1,471	92	613	400	54	1,920	195	188,850
	CH	51,741	90,635	155,645	76,785	78,558	56,338	913	15,357	92	576	369	970	16,336	754	545,069
	SI	57,902	20,392	11,780	37,830	11,690	7,845	238	2,601	27	474	275	63	2,245	252	153,614
	LM	90,724	51,669	42,859	40,815	92,288	30,140	752	11,953	75	941	665	492	9,898	770	374,041
	AA	108,999	11,700	7,685	7,346	8,950	25,292	184	2,917	131	1,190	493	151	2,882	522	178,442
	BA	2,110	1,548	1,084	1,165	1,261	765	1,269	345	1	27	5	13	222	26	9,841
	BB	69,656	14,008	12,358	13,431	17,834	10,950	322	8,321	120	588	444	145	2,708	297	151,182
	JE	1,339	7	0	5	6	2	0	1	735	32	6	0	5	14	2,152
	MO	13,002	143	60	289	94	104	3	43	11	3,837	235	1	68	92	17,982
	RW	6,470	59	29	129	33	69	8	17	12	106	2,010	1	49	43	9,035
	SA	521	505	651	594	609	594	8	134	3	16	30	878	215	363	5,121
	SH	2,265	1,909	987	901	1,254	1,428	14	356	17	50	38	15	6,388	59	15,681
	Other	2,691	331	335	375	323	301	8	104	18	53	26	23	126	1,318	6,032
	Total	**1,049,057**	**229,058**	**238,973**	**187,058**	**219,627**	**139,609**	**3,839**	**44,101**	**1,691**	**9,755**	**5,938**	**2,812**	**43,461**	**5,147**	**2,180,126**

* Source Dept. of Agriculture and Food 2002

Looking at trends for other breeds indicates that the number of "pure-bred" Jersey calves in 2002 was 735, Montbelliarde calves was 3,837 and for the Red Breeds (i.e., Rotbunt, MRI and Scandinavian Reds) 2,010. In contrast, the trends for "cross-breeds" (within-these breeds) was somewhat higher with 1,696 calves being the progeny of HF*Jersey crosses, 14,254 the progeny of HF*Montbelliarde crosses and 7,412 the progeny of HF*Red crosses. Based on these breed combinations, this suggests that 23,362 cross-bred dairy calves were born in 2002 (or about 4.3% of the total calves born to these breeds).

Looking at trends for beef breeds would suggest that of the 2.18 million calves born in 2002, some 155,645 were the progeny of both a Charolais sire and Charolais dam (i.e. 3/4 bred or greater). Given the level of pedigree registrations within this and other beef herdbooks (about 30,000 calves/annum), this would suggest a huge opportunity for "grading-up animals" within these herdbooks – in the same way as is currently applied by the IHFA (the number of 3/4 bred calves born to the main beef breeds in 2002 was 353,883).

Whilst the opportunities for grading-up are substantial within the beef herdbooks, the majority of beef farmers still opt for cross-breeding when generating animals for slaughter or breeding replacements for their beef herd. For example, the number of cross-bred beef calves born in 2002 was 680,340 – about 66% of the total beef calves born (this is in contrast to trends within the dairy herd where only 4% of the calves born are the progeny of 2 different breeds).



Chapter 2 – Dairy and Beef Performance Data
(i) Animal Events – Calving Performance

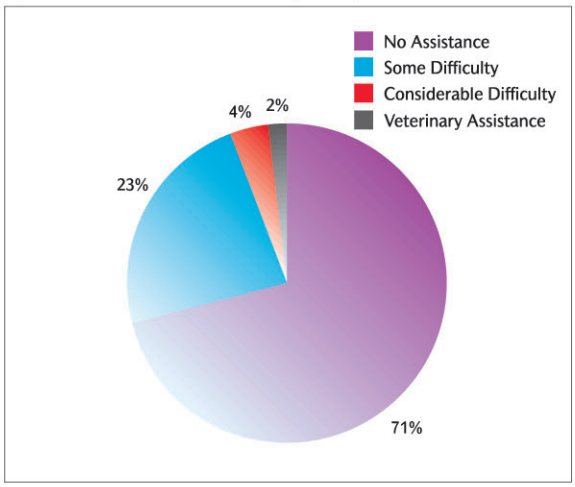
- *3.3% mortality recorded through Animal Events*
- *20-fold increase in % of calving survey records*
- *Large variation in calving performance within breeds*

Table 2.1 Animal Events – Trends in Mortality and Calving Performance (2002 and 2003)

	2002		2003	
	Records	% Total	Records	% Total
Animal Event Registrations	283,967		333,785	
Animal Event - Live Births	268,291	94.5%	317,764	95.2%
Animal Event - Dead at Birth	12,219	4.3%	11,123	3.3%
Animal Event - Abortions	3,457	1.2%	4,898	1.5%
With Calving Survey	215,881	77.0%	228,988	69.6%
- No Assistance	149,251	69.1%	162,489	71.0%
- Some Assistance	52,459	24.3%	53,361	23.3%
- Considerable Difficulty	9,744	4.5%	8,896	3.9%
- Veterinary Assistance	4,427	2.1%	4,242	1.9%

The total number of calves registered as "dead at birth" through Animal Events in 2003 was 11,123, or 3.3% of the total calves registered (Table 2.1). This figure is slightly lower than that in 2002 and may be explained by the increasing practice of herd-owners using "white-cards" to register dead calves. In addition, a further 4,898 records were registered as abortions (1.5% of the total calves registered).

Fig 2.1 Animal Events – Extent of Calving Difficulty (2003)



The total number of Animal Event records with calving survey data in 2003 was 228,988 or 69.6% of the total calved registered (Table 2.1). Of this number, 71% of births were recorded as requiring no assistance (162,489 records in total) and 5.8% of births were recorded as being either considerably difficult or requiring veterinary assistance (13,138 records in total – Figure 2.2).

Looking at trends in calving performance (Table 2.2 and Figure 2.2) indicates an almost 20-fold increase in the level of calving performance recording, from 12,064 in 2001 (before the introduction of Animal Events) to 228,988 in 2003.

Fig 2.2 Trends in Level of Calving Performance Recording (1994 – 2003)

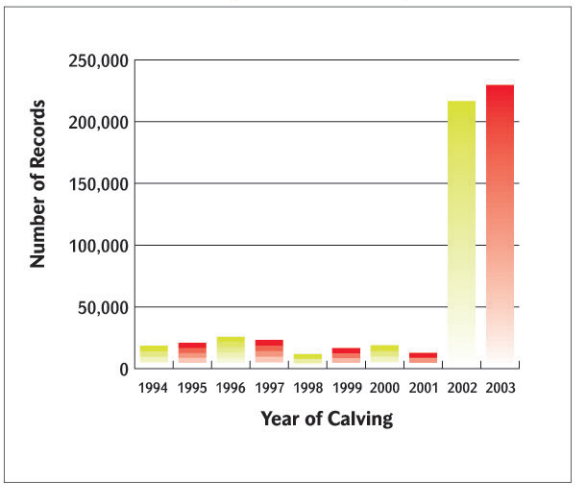


Table 2.2 Trends in Level of Calving Performance Recording (1994 – 2003)

	No. Records		No. Records
1994	17,855	1999	15,837
1995	20,152	2000	18,183
1996	25,048	2001	12,064
1997	22,489	2002	215,881
1998	10,996	2003	228,988

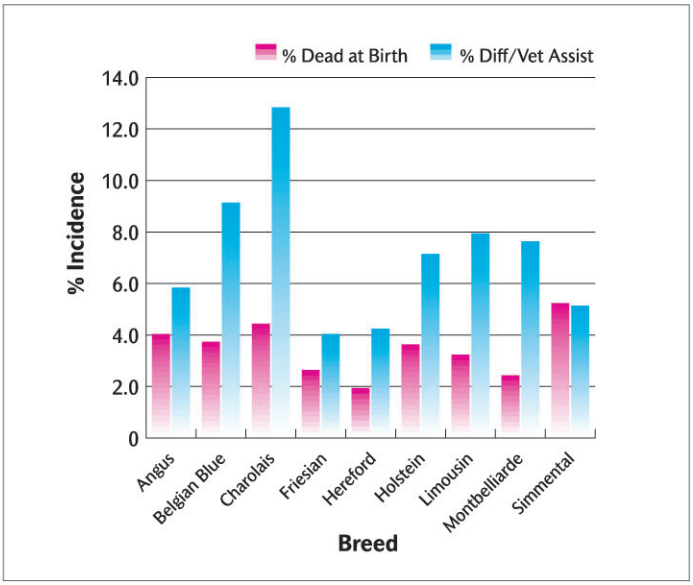
Table 2.3 Comparison of Mortality and Calving Performance for Various Breeds (2003)*

Breed of AI Sire	Progeny Records	No. Sires**	% Mortality - Dead at Birth			% Diff/Vet Assist Births		
			Average	Max	Min	Average	Max	Min
Angus	7,177	18	4.0%	9.4%	0.0%	5.8%	10.5%	1.5%
Belgian Blue	9,685	20	3.7%	7.5%	0.9%	9.1%	19.5%	1.3%
Charolais	793	5	4.4%	6.2%	3.6%	12.8%	20.9%	3.1%
Friesian	16,848	32	2.6%	6.8%	0.0%	4.0%	9.7%	0.0%
Hereford	1,852	10	1.9%	1.7%	0.0%	4.2%	18.2%	0.0%
Holstein	113,412	221	3.6%	16.7%	0.0%	7.1%	50.7%	0.0%
Limousin	2,815	6	3.2%	4.3%	1.5%	7.9%	10.1%	5.8%
Montbelliarde	2,558	9	2.4%	5.3%	0.6%	7.6%	17.6%	2.6%
Simmental	566	5	5.2%	8.1%	2.7%	5.1%	8.6%	0.0%

* Based on Sires with a Minimum of 50 Progeny Recorded through Animal Events
** Includes Only Breeds with a Minimum of 5 Sires Meeting Above Criteria

A comparison of breeds (Table 2.3 and Figure 2.4) suggests some differences between breeds for average mortality and % calving difficulty. For example, the breed of AI sire with the highest mortality level was the Simmental breed (5.2%), compared to 1.9% for the Hereford breed. Comparable figures for calving difficulty were 12.8% for the Charolais breed and 4.0% for the Friesian breed.

Fig 2.3 Comparison of Mortality and Calving Performance for Various Breeds (2003)*



Whilst differences between breeds were relatively small, variation within breeds was somewhat larger, with all breeds indicating a large range in calving performance for each of these traits (Table 2.3). This was most evident within the Holstein breed, were the range varied from a low of 0.0% up to a high 50.7% (this was across 221 AI sires with a minimum of 50 progeny recorded in 2003).

Chapter 2 – Dairy and Beef Performance Data

(ii) Animal Events – Health and Fertility Performance

- 47,502 health & fertility related traits recorded
- Large increase in incidence of parasitic infection
- Some 350,000 insemination/non-service heat events recorded

Table 2.4 Trends in Recording Health and Fertility Events (2002 and 2003)

	2002	2003
Health/Fertility Events	36,869	47,502
- Mastitis	11,471	11,600
- Parasitic Infection	8,880	16,344
- Castration	7,974	9,488
- Lameness	1,824	1,562
- Retained Plascenta	1,346	1,182
- Respiratory Disease	995	1,318
- Milk Fever	622	516
- Scour	572	998
- Ketosis	360	156
- Other Events	2,825	4,338
Culling Events	4,423	2,792
- Infertility	1,486	943
- Old Age	573	334
- Poor Health	455	318
- Low Yield	329	231
- Injured	277	130
- Feet & Leg Problems	256	121
- Others	1,047	715

A total of 47,502 health events and 2,792 culling events were recorded through Animal Events in 2003 (Table 2.4 and Figure 2.4). This is only the second year that such events have been recorded as part of a national recording program in Ireland. The most prevalent health recorded events were parasitic infection (34.4% of the events recorded), mastitis (24.4%) and lameness (3.3%). The most prevalent reason for culling animals was infertility (33.8% of the events recorded) and old age (12.0%).

Looking at trends in the recording of these events (Figure 2.4) indicates a marked increase in the recording of health/fertility traits over the last 2 years (up 29% compared to 2002), with the largest increase being in the recording of parasitic infection (up 84% compared to 2002). In contrast, the level of recording of culling events has dropped slightly from 4,423 events recorded last year to 2,792 events recorded in 2003 (down 1,631 events).

Fig 2.4 Trends in Recording Health and Fertility Events (2002 and 2003)

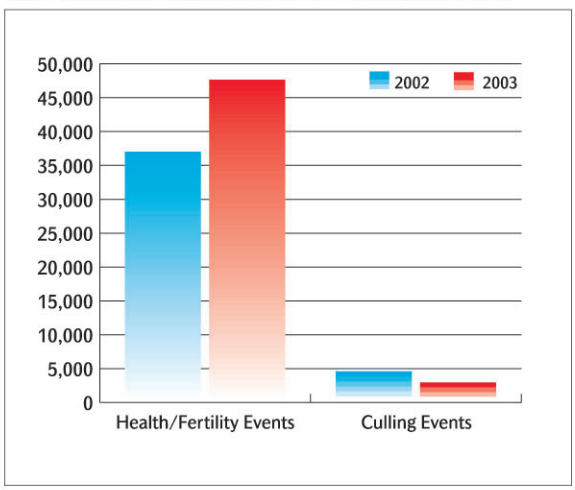
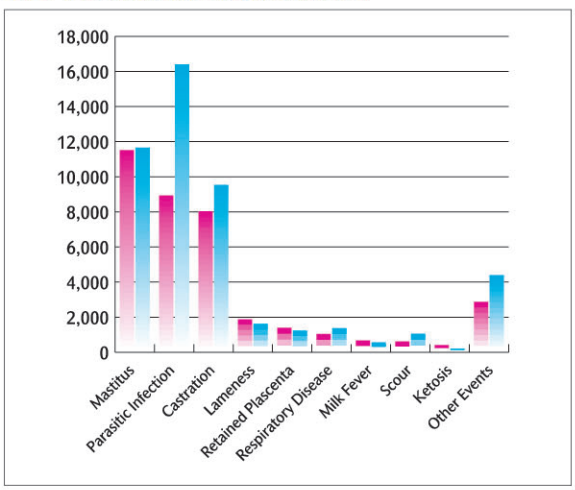


Fig 2.5 Trends in Health Recording (2002 and 2003)

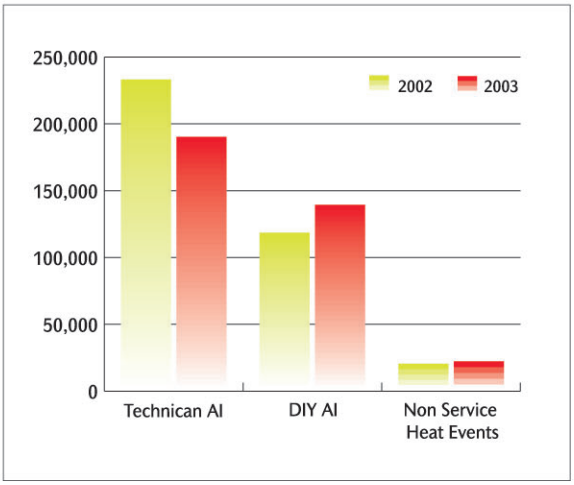


The number of insemination events and non-service heat events recorded in the cattle-breeding database in 2003 was 349,861 (Table 2.5). Of these events, 189,588 were from the technician AI service (54.1%), with the remainder being recorded through Animal Events as DIY inseminations (138,725) and non-service heats (21,548).

Table 2.5 Recording Insemination and Non Service Heat Events (2002 and 2003)

	2002	2003
Insemination/Non Service Heat Events	370,074	349,861
– Technician AI	232,520	189,588
– DIY AI	117,871	138,725
– Non Service Heat Events	19,683	21,548

Fig 2.6 Trends in Recording Insemination and Non Service Heat Events (2002 and 2003)



The level of recording of these events dropped slightly in 2003 compared to 2002, down from 370,074 in 2003 to 349,861 in 2002 (a drop of some 5,5%). A closer examination of these trends indicates that all of the drop occurred in the area of technician AI recording, with both DIY AI events and non-service heat events showing an increased level of recording compared to 2002 (Figure 2.6).

Chapter 2 – Dairy and Beef Performance Data
(iii) Dairy Recording – Milk Production Performance

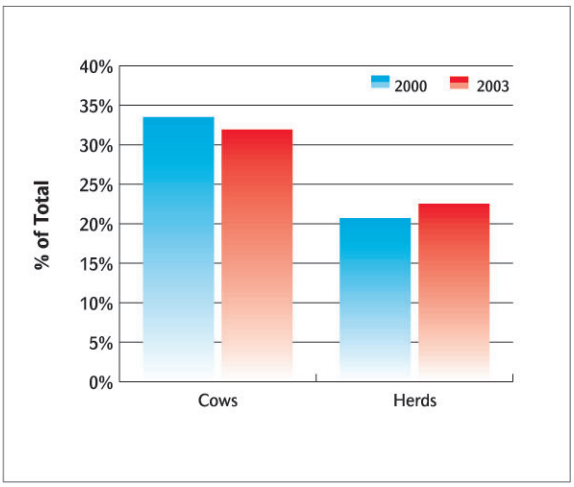
- 32% of cows and 22% of herds involved in milk recording
- 1.5% increase in milk solids (fat & protein) production
- 99% of cows in milk recording from Holstein Friesian breed
- 17% increase in SCC
- 61% increase in level of dairy linear scoring

Table 2.6 Total Cows and Herds Recorded in Ireland (2000 vs. 2003)

	Milk Recorded Herds		National Dairy Population		% Total	
Year	Cows	Herds	Cows	Herds	Cows	Herds
2000	391,975	7,047	1,173,060	34,200	33.4%	20.6%
2003	365,128	6,916	1,149,480*	30,900*	31.8%	22.4%

* Based on Dec 2001 Census (Last Census Date)

Fig 2.7 Trends in Cows and Herds Recorded in Ireland (2000 vs. 2003)



Some 365,128 cows in 6,916 herds were involved in milk recording in 2003 (Table 2.6). Expressing these figures as a proportion of the total dairy cows and herds in Ireland (Figure 2.7) indicates that some 31.8% of the cows and 22.4% of the herds in the National dairy population are involved in milk recording. Comparing these figures with figures from 3 years ago, suggests that proportion of cows in milk recording has dropped slightly over this last 2 years, while the proportion of herds has increased slightly (Figure 2.7). It should also be noted that this level of milk recording is considerably lower than that experienced in other developed dairying countries, where the level of milk recording is typically in excess of 60%.

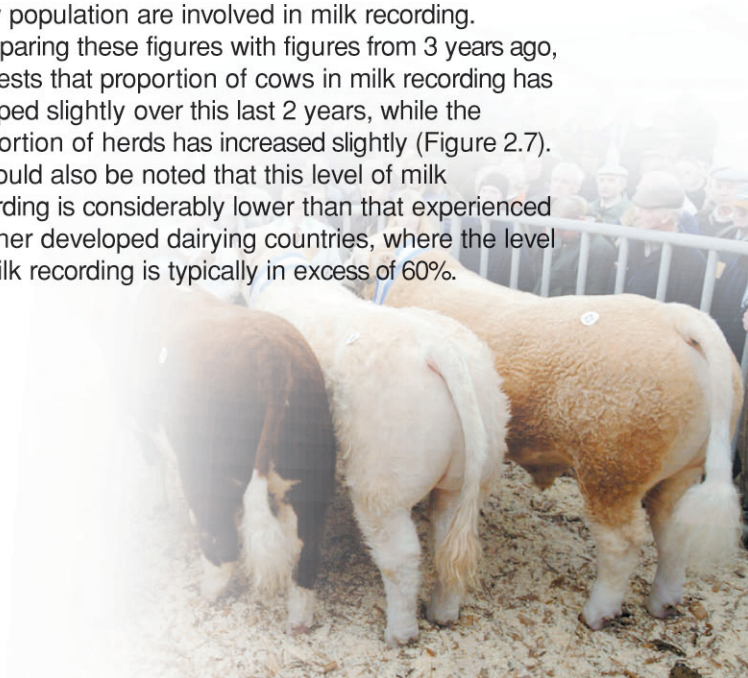


Table 2.7 Average Production for all Milk Recorded Cows (1994 – 2003)

	Records	Days in Milk	Milk kg	Fat kg	Fat %	Ptn kg	Ptn %
1994	248,638	272	5,263	187.3	3.56	172.5	3.28
1995	330,544	266	5,259	187.2	3.56	170.6	3.24
1996	355,105	262	5,215	186.6	3.59	169.5	3.26
1997	346,560	266	5,302	190.8	3.61	173.0	3.27
1998	369,919	267	5,293	193.3	3.67	173.8	3.29
1999	363,871	272	5,534	202.3	3.67	182.7	3.31
2000	350,263	277	5,884	216.2	3.67	195.5	3.33
2001	303,313	267	5,954	220.0	3.70	196.6	3.31
2002	282,156	270	6,049	224.7	3.71	201.6	3.33
2003	310,456	273	6,166	226.9	3.67	205.9	3.33

The average milk performance for cows recorded in 2003 was 6,166 kg milk, 226.9 kg fat (3.67%) and 205.9 kg protein (3.33%). This represents an increase in milk solids production of some 6.5 kg compared to 2002 (1.5% of total solids production). The increase in total solids production is consistent with recent trends in this area (Figure 2.8 and 2.9), which have indicated a steady increase in fat and protein production over the last 7 years. However, the increase in butterfat production would appear to have reduced – evidenced by the fact that butterfat content has declined from 3.71% to 3.67% during the past 12 months.

Fig 2.8 Trends in Fat and Protein Kg (1994 – 2003)

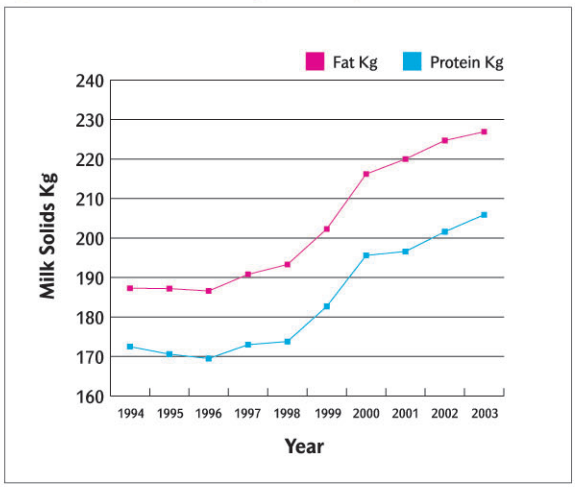
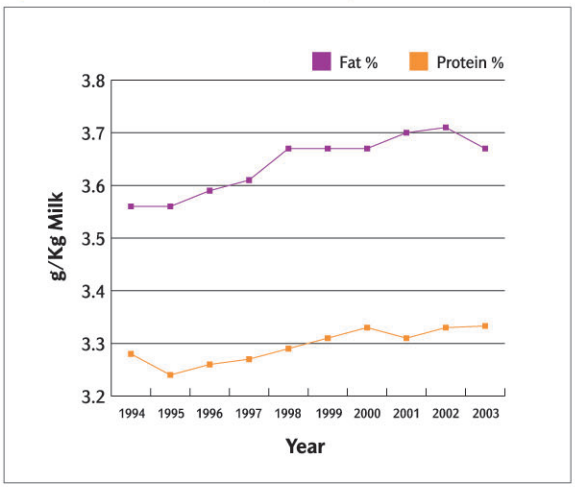


Fig 2.9 Trends in Fat and Protein % (1994 – 2003)



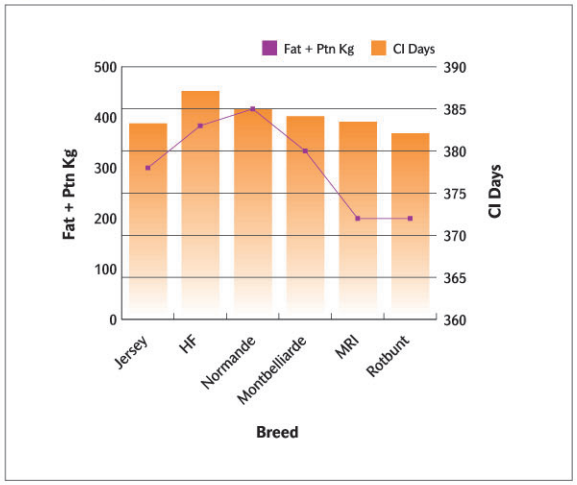
The Holstein Friesian breed was by far the most dominant breed of cow in milk recording in 2003, accounting for 99% of the cows milk recorded (Table 2.8). This was also the breed with the highest milk solids production (450 kg fat + protein/lactation), followed by the Normande breed (414 kg solids), the Brown Swiss breed (408 kg solids) and the Montbelliarde breed respectively (400 kg solids).

Table 2.8 Average Milk and Fertility Performance for Animals with Known Parentage (2003)

Sire Breed*	Cows	Milk Kg	Fat Kg	Ptn Kg	Fat%	Ptn%	SCC	Days in Milk	CI Days**
Ayrshire	70	5,409	195.6	179.4	3.62%	3.32%	172.7	279.0	392.9
Brown Swiss	54	5,843	210.9	197.9	3.61%	3.39%	102.2	280.4	379.9
Jersey	171	4,629	216.0	169.6	4.67%	3.66%	185.1	258.7	378.4
Kerry	32	5,296	197.4	180.9	3.73%	3.42%	252.0	248.5	367.0
Holstein Friesian	224,845	6,417	235.6	214.1	3.67%	3.34%	194.3	278.1	382.6
Normande	133	5,711	214.8	199.3	3.76%	3.49%	245.7	265.6	385.0
Montbelliarde	1,338	5,707	207.2	192.8	3.63%	3.38%	126.2	273.9	379.7
Meuse Rhine Issel	632	5,380	200.2	189.0	3.72%	3.51%	207.8	272.7	371.9
Rotbunt	165	4,980	190.4	175.6	3.82%	3.53%	151.1	273.5	371.6
Shortorn	201	5,543	199.7	184.4	3.60%	3.33%	170.5	276.4	402.9
Simmental	367	5,385	195.5	180.6	3.63%	3.35%	185.2	267.6	417.2

* Breed groups are based on Sire Breed and may therefore include cross-breds
** CI Days are based on interval from 1st to 2nd lactations only

Fig 2.10 Comparison of Milk and Fertility Performance for a Number of Breeds



Comparing trends for fertility performance suggests that whilst the Holstein Friesian breed produced most solids, this was done at some extra expense (the average calving interval for this breed was 383 days compared to an optimal calving interval of 365 days). Other breeds had somewhat shorter calving intervals than the Holstein Friesian breed, most notably the MRI breed (368 days) and the Rotbunt breed (372 days). However, even given this lower calving interval, it is debatable whether these other breeds could compete with the Holstein Friesian breed in overall profit terms, given the large difference in milk solids production (Figure 2.10).

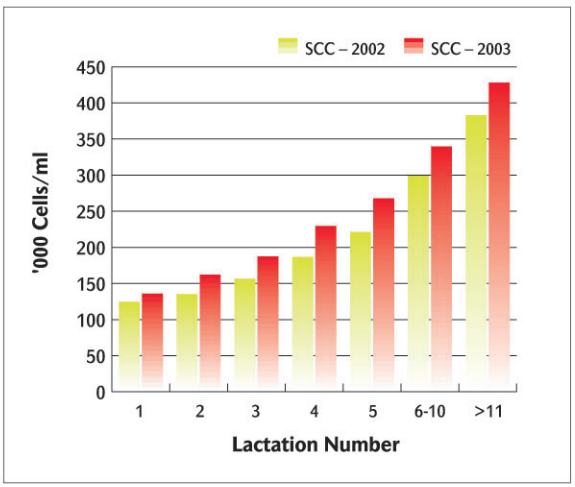
Table 2.9 Average Milk Performance by Parity (2003)

Lact No.	Records	Milk Kg	Fat Kg	Ptn Kg	Fat%	Ptn%	SCC	Lact Length
1	70,692	5,490	205.6	183.5	3.75%	3.34%	134.6	277.3
2	61,015	6,249	229.9	210.3	3.68%	3.37%	160.9	276.3
3	47,150	6,566	241.5	220.1	3.68%	3.35%	186.0	275.6
4	40,158	6,642	243.8	221.8	3.67%	3.34%	228.2	274.2
5	31,885	6,590	241.6	219.4	3.67%	3.33%	266.4	273.1
6-10	56,929	6,174	224.6	204.3	3.64%	3.31%	338.2	267.9
11-15	2,627	5,316	188.8	174.0	3.55%	3.27%	426.9	256.4

Table 2.10 Participation in IHFA Linear Assessment Schemes (1997-2003)

	Animals
1997	9,965
1998	7,898
1999	16,398
2000	13,096
2001	12,039
2002	13,262
2003	21,410

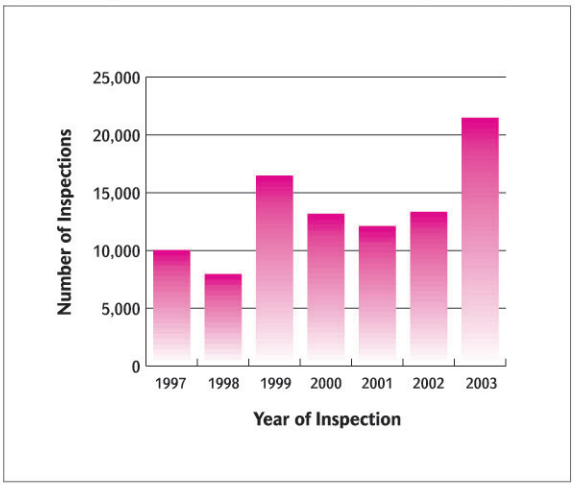
Fig 2.11 Comparison of SCC by Parity (2002 vs. 2003)



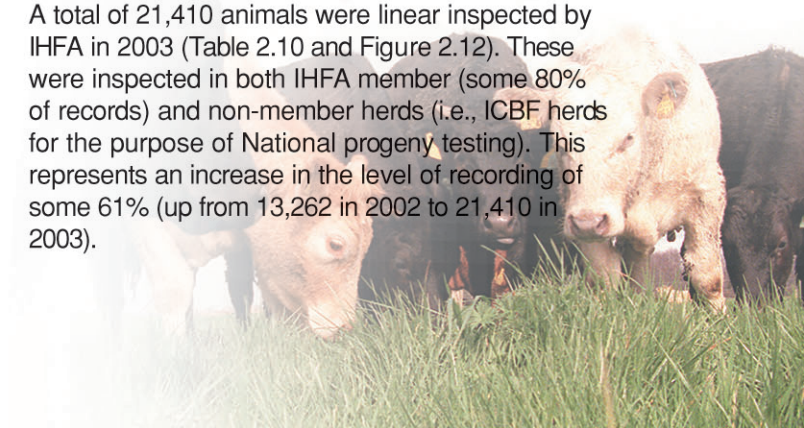
Looking at trends in lactation number (Table 2.9) suggests that some 71% of cows in milk recording in 2002 (219,015) were in lactations 1-4 (Table 2.9). Milk solids production (fat + protein kg) was highest for animals in their 4th lactation (465 kg) but declined thereafter. In contrast SCC levels increased almost linearly with age (Figure 2.11) and were highest for animals in their 6th lactation and above (338,000 cells and 427,000 cells for groups 6-10 and 11-15 respectively).

Comparing trends for SCC between 2002 and 2003 indicates a large increase in SCC across all lactations (on average SCC increased from 182,000 cells in 2002 to 213,000 cells in 2003 – an increase of some 17% compared to last year). This trend was apparent across all lactations and was largest for animals in lactations 4-5 (the increase for animals in these parity groups was typically around 45,000 cells/ml).

Fig 2.12 Participation in IHFA Linear Assessment Schemes (1997 – 2003)



A total of 21,410 animals were linear inspected by IHFA in 2003 (Table 2.10 and Figure 2.12). These were inspected in both IHFA member (some 80% of records) and non-member herds (i.e., ICBF herds for the purpose of National progeny testing). This represents an increase in the level of recording of some 61% (up from 13,262 in 2002 to 21,410 in 2003).



Chapter 2 – Dairy and Beef Performance Data
(iv) Beef Recording

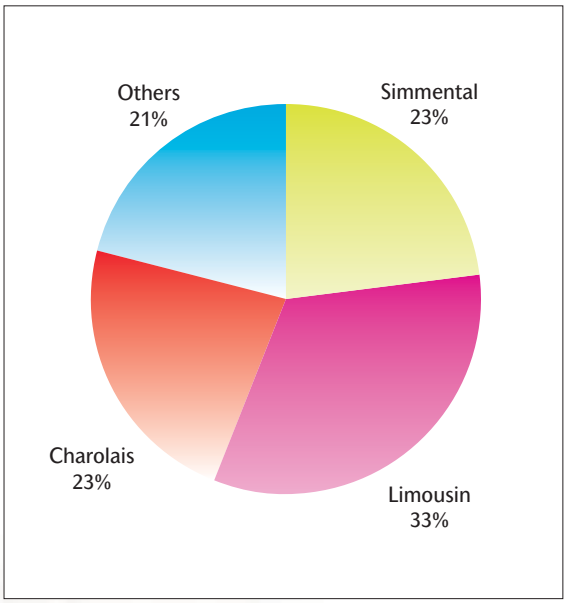
- *Decrease in number of bulls through Tully*
- *Increase in level of linear scoring and weight recording for a number of breeds*
- *Less than 1% of National beef population in performance recording*

Table 2.11 Trends in Participation in Tully by Breed (1997 – 2003)

Year	Angus	Aubrac	B Blue	B d'Aquit.	Charolais	Hereford	Limousin	Salar	Simmental	Others	Total
1997	11	0	9	2	62	17	61	0	32	0	194
1998	20	0	1	12	45	18	83	0	37	0	216
1999	19	3	7	3	43	25	58	5	53	0	216
2000	25	5	4	8	35	19	86	7	56	3	248
2001	16	13	4	14	29	8	69	11	31	8	203
2002	12	4	0	3	35	5	52	19	21	2	153
2003	7	5	4	2	30	5	44	3	30	3	133
Total	**110**	**30**	**29**	**44**	**279**	**97**	**453**	**45**	**260**	**16**	**1363**

The number of bulls tested through Tully dropped in recent years from 203 in 2001 to 133 in 2003 (a decline of some 34%). This was due to; (i) a reduction in the number of bull intakes (from 5 intakes/year to 3 intakes/year), and (ii) more stringent pre-selection of bulls for performance testing (Table 2.11). The most prevalent breed on test was the Limousin with 33% of the bulls on test in 2003 (Figure 2.13), followed by the Charolais and Simmental breeds respectively (23% each).

Fig 2.13 Participation in Tully by Breed



Three herdbook associations offered a linear scoring and weight recording service in 2003; the Charolais breed, the Limousin breed and the Simmental breed (Table 2.12). Looking at animals born in 2002 (the majority of which will have been scored in 2003), indicates that some 5,350 animals were scored by the Charolais herdbook, 4,386 animals were scored by the Limousin herdbook and 1,450 were scored by the Simmental herdbook. In addition to a linear scoring service, weight recording services are also available to members of these herdbooks with 5,964, 3,101 and 1,162 animals weight recorded in the Charolais, Limousin and Simmental herdbooks in 2003 (the Charolais herdbook offered its own service in 2003, whilst the Limousin and Simmental herdbooks used the service offered by DAF). Looking at trends over the last few years, indicates a general increase in the number of animals participating in these schemes within each of the organisations.

In addition to the Limousin and Simmental breeds, DAF offered a weight recording service to a number of other breeds in 2003; notably the Angus, Hereford, Belgian Blue, Salers and Blonde d'Aquitaine. The number of animals weight recorded across these breeds was about 500.

Table 2.12 Trends in Beef Recording by Breed (1993 – 2003)

	Charolais		Limousin		Simmental	
Birth	**Linear**	**Weights**	**Linear**	**Weights**	**Linear**	**Weights**
1993	0	554	1711	377	0	389
1994	279	586	2037	383	0	444
1995	1758	697	2272	628	0	426
1996	3683	797	2694	711	0	404
1997	2397	1393	3025	1013	0	362
1998	3657	3683	3375	1429	306	296
1999	3846	3923	3702	1594	826	493
2000	4139	3899	4715	1638	1353	749
2001	4602	5231	4772	2470	1600	861
2002	5350	5964	4386	3101	1450	1162
2003	2291	3033	1330	1860	461	960

There are currently two types of AI beef progeny test scheme for carcass traits; (i) the central progeny test scheme or (ii) the on-farm scheme (first introduced in 2000). Some 2,079 records have been collected as part of the centralised scheme (since 1990), whilst 1,469 records have been collected as part of the on-farm scheme (since 2000). The most prevalent breeds in each of these schemes were the Belgian Blue, the Charolais and the Simmental breeds respectively (Table 2.13).

Combining data from pedigree beef herds (some 11,200 records), Tully (153 records) and AI progeny testing (some 600 records), suggests that approximately 12,000 animals were involved in beef performance recording in 2002. Expressing this as a proportion of the National beef calf population (some 1.6 million calves/annum), suggests that about 0.75% of all beef calves born are involved in beef performance recording, which is considerably lower than that achieved within the dairy population.

Table 2.13 Animal Events – Trends in Progeny Testing by Breed (2003)

Breed	Central Stat.	On-farm
Angus	288	159
Hereford	317	45
Charolais	524	283
Limousin	343	17
Simmental	263	455
Blonde d'Aquitainne	33	0
Belgian Blue	311	510
Total	**2079**	**1469**

Chapter 3 – Breeding Scheme Design and Genetic Gain
(i) Organisational Structure

- *7 organisations providing milk recording services*
- *Reduction in average herd size in milk recording*
- *7 organisations providing AI services*
- *7.9% decline in first inseminations*

Table 3.1 Herds and Cows Recorded by Milk Recording Organisations (2003)

Milk Recording Organisation	Total Herds	Total Cows	A4 Herds	A4 Cows	A6 Herds	A6 Cows	A8 Herds	A8 Cows	Herd
Arrabawn Co-op	131	7,028	30	1,472	83	4,328	18	1,228	53.6
Connacht Gold	138	6,787	112	5,619	23	1,065	3	103	49.2
Dairygold AI & Farm Services	1,767	100,405	514	29,036	1,056	58,494	197	12,875	56.8
Kerry Agribusiness	1,236	61,769	488	24,881	579	29,504	169	7,384	50.0
Progressive Genetics	2,435	128,188	2,089	108,835	113	6,435	233	12,918	52.6
South Western Services	1,047	52,798	364	17,816	610	30,712	73	4,270	50.4
Tipperary Co-op	162	8,153	101	5,204	53	2,456	8	493	50.3
All Societies Total 2003	**6,916**	**365,128**	**3,698**	**192,863**	**2,517**	**132,994**	**701**	**39,271**	**52.8**

Seven organisations offered a milk recording service to farmers during 2003 (Table 3.1). The largest milk recording organisation (based on number of cows recorded) was Progressive Genetics with 35.1% of the total cows recorded (128,188 cows), followed by Dairygold AI & Farm Services (27.5%), Kerry Agribusiness (16.9%) and South Western Services (14.5%). Combined these organisations accounted for 343,450 of the total cows recorded in 2003 (some 94% of the total cows in milk recording in 2003).

Table 3.2 Herds and Cows Recorded by Milk Recording Organisations (1999 – 2003)

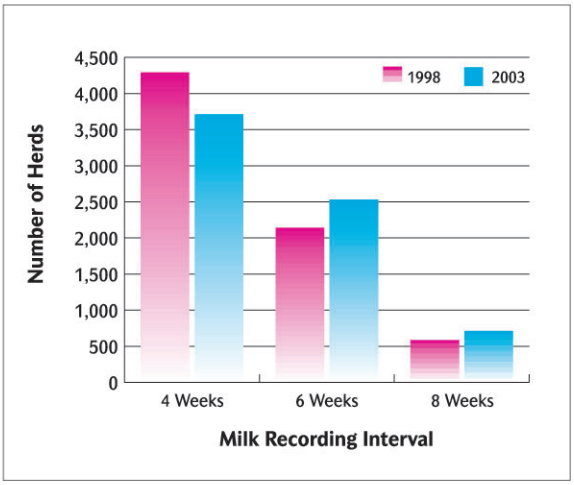
Milk Recording Organisation	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
Arrabawn Co-op	115	125	73	119	131	5,759	6,267	3,872	6,251	7,028
Connacht Gold	135	135	128	128	138	5,670	6,278	5,911	5,911	6,787
Dairygold AI & Farm Services	1,755	1,714	1,538	1,673	1,767	104,241	100,312	86,282	98,289	100,405
Kerry Agribusiness	1,239	1,245	1,012	1,169	1,236	62,606	65,699	53,353	63,479	61,769
Progressive Genetics	2,639	2,640	2,366	2,455	2,435	153,069	151,174	134,069	142,263	128,188
South Western Services	971	1,002	888	1,016	1,047	51,245	52,133	46,254	52,373	52,798
Tipperary Co-op	192	186	135	135	162	10,370	10,112	7,127	7,127	8,153
All Societies Total 2003	**7,046**	**7,047**	**6,140**	**6,695**	**6,916**	**392,960**	**391,975**	**336,868**	**375,693**	**365,128**

Looking at trends over time (Table 3.2) indicates a slight drop in the number of cows milk recorded in 2003 (down 10,565 compared to 2002). In contrast the number of herds involved in milk recording in 2003 increased by 221 (up to 6,916), suggesting that the herds that exited milk recording in 2003 were generally larger herds – hence the drop in average herd-size in 2003. It is also prudent to note that the number of cows in milk recording has still not returned to the level enjoyed pre-F&M (some 392,000 in both 2000 and 2001).

Table 3.3 Trends in Milk Recording Method (1997 – 2003)

	A4 Herds	A6 Herds	A8 Herds	Total Herds
1997	4,192	1,939	537	6,667
1998	4,279	2,128	575	6,982
1999	4,169	2,268	609	7,046
2000	3,996	2,364	687	7,047
2001	3,568	2,062	513	6,140
2002	3,553	2,514	628	6,695
2003	3,698	2,517	701	6,916

Fig 3.1 Trends in Milk Recording Method (1998 – 2003)



Three types of milk recording scheme were offered to farmers in 2003 (Table 3.3); the A4 scheme (recording every 4 weeks), the A6 scheme (recording every 6 weeks) and the A8 scheme (recording every 8 weeks). The A4 scheme was the most popular scheme, with 53.4% of farmers opting for this scheme (3,698 herds in total). However, recent trends in milk recording method (Figure 3.1), suggest a gradual movement away from this type of scheme towards schemes with a longer recording interval.

Chapter 3 – Breeding Scheme Design and Genetic Gain
(ii) Artificial Insemination Usage

- *33% drop in AI usage over last 10 years*
- *Drop in insemination usage largest for Holstein Friesian, Hereford and Simmental breeds*
- *AI penetration rate of 44%*

Table 3.4 Trends by Breed and Organisation (2003)

AI Organisation	Shorthorn	Freisian	Hereford	Angus	Charolais	Simmental	Limousin	Bel Blue	Others	Total
Dairygold Co-op	395	82,135	6,086	13,382	3,911	1,475	6,255	6,927	5,480	**126,046**
Dovea AI	779	38,241	4,267	8,653	10,739	2,983	13,057	4,546	1,863	**85,128**
Kerry AgriBusiness	654	33,242	4,633	7,583	11,486	2,181	16,254	9,575	2,698	**88,306**
Progressive Genetics Co-op	2,490	71,967	5,132	24,145	41,158	7,350	34,916	28,169	5,515	**220,842**
South Western Services Co-op	258	31,150	2,289	5,579	2,106	964	2,621	3,445	1,679	**50,091**
Eurogene/AI Services	299	12,090	766	2,017	1,791	442	2,483	2,482	6,196	**28,566**
Bova AI	715	10,615	3,244	4,447	12,256	2,911	13,966	7,562	2,007	**57,723**
Total	**5,590**	**279,440**	**26,417**	**65,806**	**83,447**	**18,306**	**89,552**	**62,706**	**25,438**	**656,702**

A total of 7 organisations provided a technician AI service in 2003 (Table 3.4). The largest of these was Progressive Genetics (33.6% of total first inseminations), followed by Dairygold AI & Farm Services (19.2%), Kerry Agribusiness (13.5%) and Dovea AI (12.9%). Combined, the ICBF member organisations accounted for 86.9% of the total inseminations, whilst the 2 private AI organisations (Bova Genetics and Eurgene/AI Services) accounted for some 13.1% of the total inseminations.

Table 3.5 AI Trends by Organisation (2000 – 2003)

AI Organisation	2000	2001	2002	2003
Dairygold Co-op	170,853	154,574	138,751	126,046
Dovea AI	93,190	83,376	78,359	85,128
Kerry AgriBusiness	129,913	114,570	104,602	88.306
Progressive Genetics Co-op	301,150	265,558	246,600	220,842
South Western Services Co-op	65,084	58,516	54,335	50,091
Eurogene/AI Services	16,708	26,675	28,131	28,566
Bova AI	58,292	52,822	62,401	57,723
Total	**835,190**	**756,091**	**713,179**	**656,702**

Looking at insemination trends over time (Table 3.5) indicates a major decline in the number of first inseminations in 2003 compared to 2002 (down 56,477 inseminations or 7.9% in total). This decline was evident for almost organisations, with the exception Dovea AI and Eurogene/AI services, which both reported an increase in the number of first inseminations during the last 12 months.

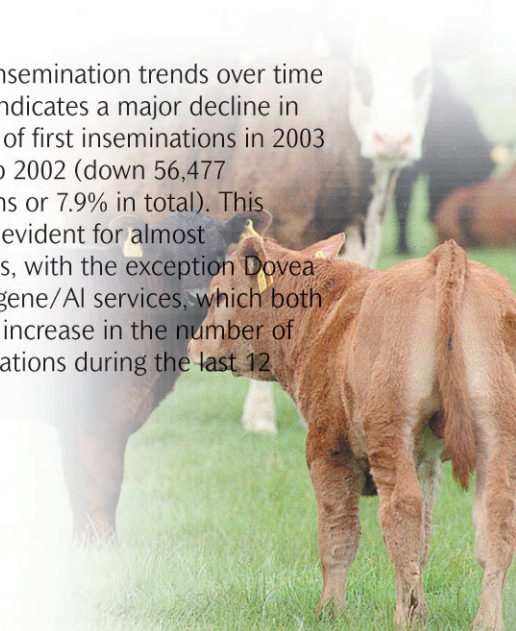


Table 3.6 Artificial Inseminations by Breed (1994 – 2003)

Breed of AI Sire	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
H Friesian	463,861	442,751	375,356	308,126	298,669	306,862	335,009	301,228	304,103	279,440
Hereford	75,694	77,836	93,561	100,030	81,114	36,488	25,260	29,824	27,599	26,417
Angus	93,498	100,806	118,563	142,784	124,998	77,032	67149	61,950	67,370	65,806
Charolais	136,245	134,701	127,308	110,901	97,039	99,648	108,763	94,248	86,244	83,447
Simmental	56,464	52,505	50,853	42,454	33,254	23,533	20,456	17,969	17,446	18,306
Limousin	92,226	91,697	93,419	84,920	80,377	100,804	116,821	105,116	97,383	89,552
Belgian Blue	44,357	48,086	54,505	57,561	57,796	94,666	132,629	107,476	78,137	62,706
Others	18,693	19,092	20,208	21,624	20,869	19,421	29,103	38,280	34,897	31,028
Total AI	**981,038**	**967,474**	**933,773**	**868,400**	**794,116**	**758,454**	**835,190**	**756,091**	**713,179**	**656,702**

Insemination trends over the past 10-years (Table 3.6 and Figure 3.2), indicates a steady decline in the number of first inseminations, from a high of 981,038 in 1994 to a low of 656,702 in 2003 (a drop of some 324,336 inseminations). The drop has been most dramatic for the Holstein Friesian breed (down some 184,000 inseminations in the past 10 years), suggesting an increased usage of either DIY AI or stock-bulls in the breeding of replacements for the National dairy herd. Similar trends are apparent for other beef breeds, notably the Simmental breed (-68%), the Hereford breed (-65%) and the Charolais breeds (-39%). In contrast the number of inseminations for the Belgian Blue breed has increased considerably over the past 10 years from a low of 44,357 in 1993 to 62,706 in 2002 (+41.0%). However, more recent trends (2000-2003) would suggest a very definite movement away from this breed as a preferred choice of AI sire (down some 70,000 inseminations in the past 4 years).

Fig 3.2 Trends in Inseminations for Holstein Friesian, Beef and Other Breeds (1998 – 2003)

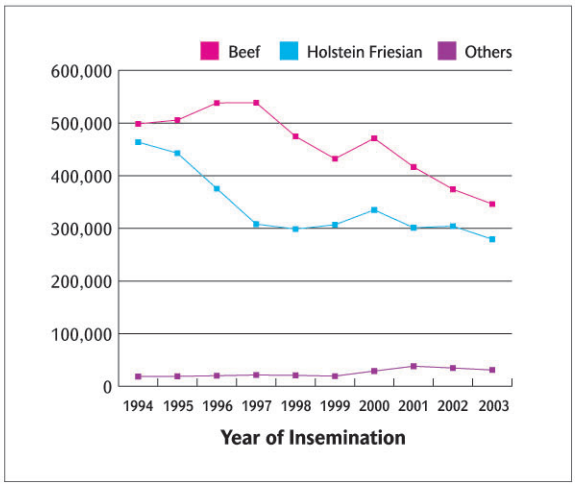
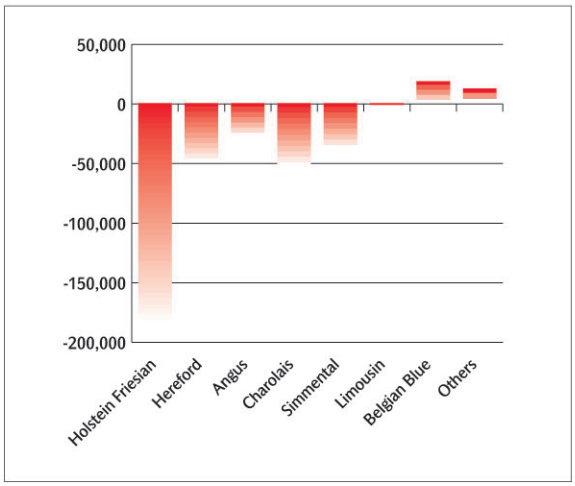


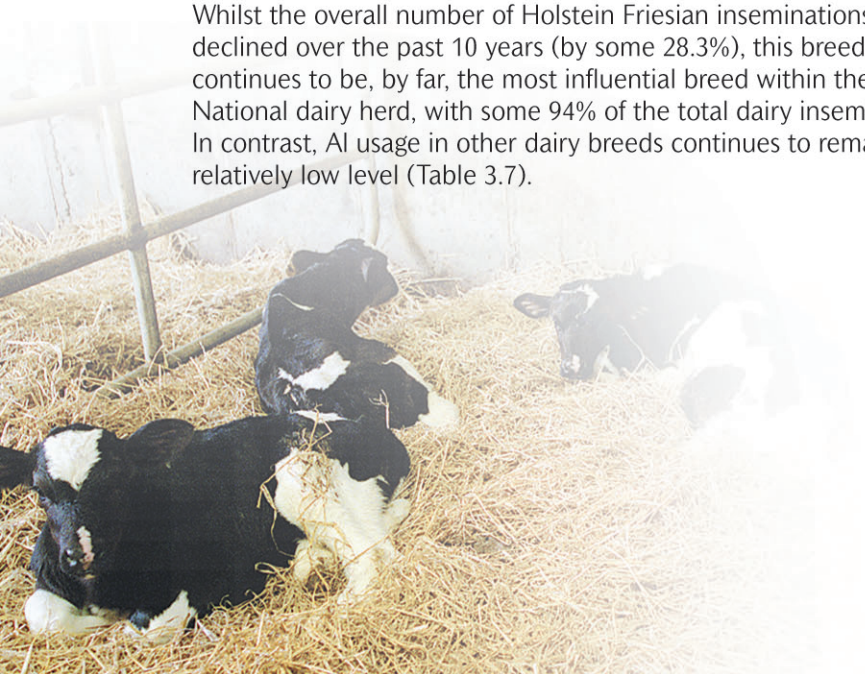
Fig 3.3 Difference in Artificial Insemination by Breed (1994 – 2003)



Whilst the overall number of Holstein Friesian inseminations has declined over the past 10 years (by some 28.3%), this breed continues to be, by far, the most influential breed within the National dairy herd, with some 94% of the total dairy inseminations. In contrast, AI usage in other dairy breeds continues to remain at a relatively low level (Table 3.7).

Table 3.7 Artificial Insemination Usage for Dairy Breeds (2001 – 2003)

	2001	2002	2003
H Friesian	301,228	304,103	279,440
MRI	1,450	1,212	998
Ayrshire	328	278	206
Jersey	1,961	1,897	1,976
Brown Swiss	203	924	1,523
Montbelliarde	9,893	11,879	9,939
Normande	368	203	237
Kerry	110	137	149
Scandinavian Red	413	317	1,071
Rotbunt	5,078	5,023	5,264
Total	**321,032**	**325,973**	**300,803**



The highly seasonal aspect to milk and beef production systems in Ireland was again evident in 2003, with two-thirds of all first inseminations taking place during the months April, May and June (Table 3.8 and Figure 3.4). This seasonality was even more evident within the dairy sector, where 189,209 of the total first inseminations happened in the 8-week period 1st April-30th June (68% of all dairy inseminations).

Table 3.8 Trends in Seasonality of AI Usage (2003)

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
H Friesian	6,818	5,454	8,413	77,436	111,773	39,546	10,140	4,901	2,259	1,111	3,233	8,356
	2.4%	2.0%	3.0%	27.7%	40.0%	14.2%	3.6%	1.8%	0.8%	0.4%	1.2%	3.0%
Beef	9,902	9,797	13,938	33,900	70,493	81,351	59,758	31,736	13,707	6,007	6,515	9,130
	2.9%	2.8%	4.0%	9.8%	20.4%	23.5%	17.3%	9.2%	4.0%	1.7%	1.9%	2.6%
Other	577	469	1,081	5,678	11,360	5,592	2,687	1,401	673	397	393	720
	1.9%	1.5%	3.5%	18.3%	36.6%	18.0%	8.7%	4.5%	2.2%	1.3%	1.3%	2.3%
Total	**17,297**	**15,720**	**23,432**	**117,014**	**193,626**	**126,489**	**72,585**	**38,038**	**16,639**	**7,515**	**10,141**	**18,206**
	2.6%	**2.4%**	**3.6%**	**17.8%**	**29.5%**	**19.3%**	**11.1%**	**5.8%**	**2.5%**	**1.1%**	**1.5%**	**2.8%**

Fig 3.4 Trends in Insemination Usage, by Month (2000 – 2003)

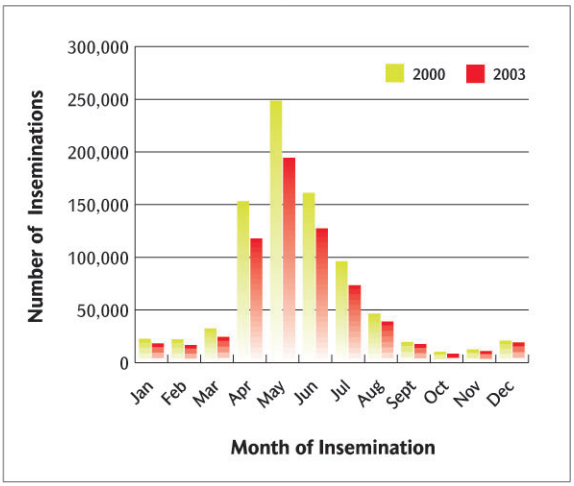


Table 3.9 DIY AI Licenses (1994 – 2003)

Year	New licenses	Renewed licenses	Licenses/year
1994	455	376	827
1995	451	380	830
1996	378	299	677
1997	430	394	824
1998	317	546	863
1999	237	422	659
2000	315	813	1128
2001	269	867	1136
2002	450	657	1107
2003	248	992	1240

In addition to inseminations through licensed AI organisations, some 3,483 dairy and beef farmers are presently licensed by the Department of Agriculture to carry out "Do-it-Yourself' Artificial Insemination (DIY AI) on their farm (licenses are valid for a period of 3-years at a time). The number of new license holders dropped from a recent high of 450 (immediately post F&M) to 248 for the year 2003.

The average herd size of licensed AI herd-owners in 2003 was 87 animals, suggesting that some 303,000 animals were covered by DIY AI last year. Assuming that all cows in DIY AI herds were artificially bred (for breeding herd replacements), this figure suggests that the total number of first inseminations last year was some 959,000. Expressing this figure as a proportion of the total calves registered (2,180,126 – Table 1.3), suggests an AI penetration rate in the National herd of approximately 44%.

Chapter 3 – Breeding Scheme Design and Genetic Gain
(iii) National Progeny Test Program

- *Decline in number of dairy and beef bulls on test*
- *Holstein most dominant dairy breed*
- *Belgian Blue most dominant beef breed*

Table 3.10 Number of Dairy and Dual Purpose Bulls on Test by Organisation (1999 – 2003)

	1999	2000	2001	2002	2003
ABS Progen	0	0	0	2	2
Bova Genetics	0	0	0	1	1
Dovea AI	10	4	9	11	6
Progressive Genetics	14	12	16	12	9
Eurogene/AI Services	10	2	6	6	12
International Livestock Genetics	8	0	1	2	3
Munster AI	30	20	11	19	18
Emerald Isle Genetics	0	0	0	0	3
MRI Society	0	0	0	0	1
Semex	0	0	0	0	3
Total	72	38	43	53	58

There are presently 10 AI organisations involved in progeny testing dairy and/or dual purpose breeds in Ireland (Table 3.10). The number of bulls going test in 2003 was 58, of which 33 are being tested by ICBF member organisations (Dovea AI, Progressive Genetics and Dovea AI) and the remainder by "private" organisations. Munster AI (an amalgam of 3 AI organisations; Dairygold, Kerry and South Western Services) were the largest organisation testing bulls in 2002 (18 bulls on test), followed by Eurogene/AI services (12 bulls on test) and Progressive Genetics (9 bulls on test).

Fig 3.5 Trends in Dairy Progeny Testing (1999 vs. 2003)

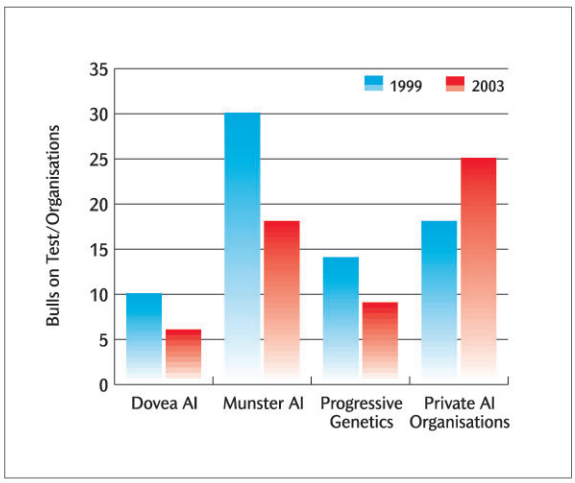


Table 3.11 Number of Dairy and Dual Purpose Bulls on Test by Breed (2001 – 2003)

	2001	2002	2003
Ayrshire	0	1	1
Brown Swiss	0	1	0
Holstein	23	34	41
Friesian	15	9	4
Jersey	0	1	1
Montbeliarde	3	4	2
MRI	0	0	1
Rotbunt	2	3	3
Shorthorn	0	0	4
Swedish Red	0	0	1
Total	43	53	58

Looking at trends in progeny testing over the past 5 years (Table 3.10 and Figure 3.5) indicates that, whilst the total number of bulls going on test has declined by some 20% (from 72 bulls in 1999 to 58 bulls in 2003), a number of private organisations have reported an increased capacity for progeny testing.

Looking at the breakdown of breeds going on test in 2003 (Table 3.11) indicates that the Holstein breed was by far the most prevalent dairy/dual purpose breed going on test last year, with 41 of the total 58 bulls going on test being from this breed.

Table 3.12 Number of Beef Bulls on Test by Organisations (1999 – 2003)

	1999	2000	2001	2002	2003
Bova AI	0	0	0	7	5
Dovea AI	9	10	9	13	2
Eurogene/AI Services	6	13	1	4	6
Goulding Genetics	0	3	1	2	2
Irish Aubrac Society	0	0	0	0	1
Irish Charolais Society	0	0	0	0	1
Irish Hereford Society	0	2	1	2	0
Irish Piemontese Society	0	0	0	4	6
Irish Saler Society	0	0	0	3	2
Irish Simmental Society	0	5	2	0	0
Irish Angus Society	0	0	1	0	0
Munster AI	14	16	10	1	5
Progressive Genetics	21	18	16	14	8
Total	**50**	**67**	**41**	**50**	**38**

Table 3.13 Number of Beef Bulls on Test by Breed (2001 – 2003)

	2001	2002	2003
Angus	2	1	5
Aubrac	1	0	1
Blonde	1	0	0
B.Blue	12	15	7
Charolais	12	11	6
Hereford	1	2	3
Limousin	8	6	5
Piemontaise	0	4	6
Parthenais	0	1	0
Saler	0	4	3
Simmental	2	4	3
Total	**41**	**50**	**39**

At present, there are 13 organisations actively involved in the National progeny test program for beef breeds (Table 3.13). The number of bulls going on test in 2002 was 38, 25 of which are being tested by ICBF member organisations and the remainder by private organisations (Bova, Eurogene/AI services and Goulding Genetics). The trend of reduced capacity for progeny testing is also prevalent within the beef sector, with a number of organisations reporting a major decline in the level of progeny testing. These are notably Progressive Genetic (-13 bulls), Munster AI (-9 bulls) and Dovea AI (-7 bulls), which collectively have reduced their capacity for beef progeny testing by 66%

Looking at the breakdown of beef breeds going on test in 2003 (Table 3.14) indicates that the most prevalent breed going on test in 2003 was the Belgian Blue breed (7 bulls), followed by the Charolais and Piemontese breeds respectively (6 bulls each).

Chapter 3 – Breeding Scheme Design and Genetic Gain
(iv) Genetic Improvement within Holstein Friesian Breed

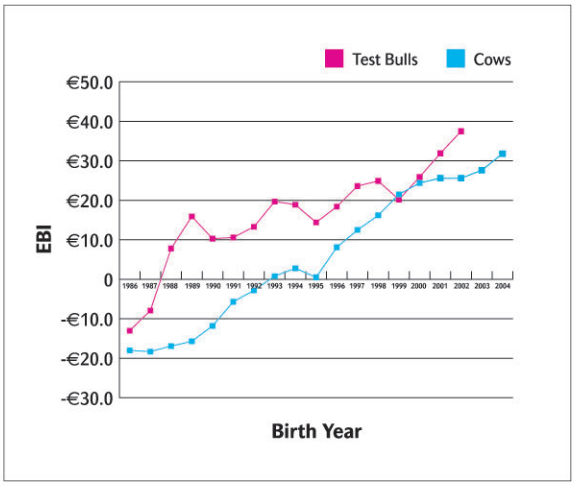
- *Genetic gain of some €5.2/cow/year in National milk recorded cow population*
- *Continued improvement in genetic merit for milk production traits*
- *Improvement in genetic merit for calving interval and survival*

The Economic Breeding Index (EBI) is the national breeding index for dairy animals. It ranks animals on overall profit and contains information on five traits related to profitable milk production; milk, fat and protein yield and 2 traits related to fertility performance, calving interval and survival. The index was recently updated (February 2004) to reflect changes in costs and returns on Irish dairy farms. The impact of these changes has been to reduce the emphasis on the milk production traits from 70% down to 60% and to increase the emphasis on the fertility related traits (up from 30% to 40%)

Table 3.14 Genetic Trends in EBI for Holstein Friesian Cows and Progeny Test Bulls

Year	Cows	Test Bulls
1986	-€18.0	-€13.0
1987	-€18.3	€7.9
1988	-€16.9	€7.8
1989	-€15.7	€15.9
1990	-€11.8	€10.3
1991	-€5.7	€10.6
1992	-€2.8	€13.3
1993	€0.8	€19.7
1994	€2.8	€18.9
1995	€5.0	€14.4
1996	€8.1	€18.4
1997	€12.5	€23.6
1998	€16.2	€24.9
1999	€21.5	€20.2
2000	€24.4	€25.9
2001	€25.6	€31.9
2002	€25.6	€37.5
2003	€27.6	
2004	€31.8	

Fig 3.6 Genetic Trends in EBI for Holstein Friesian Cows and Progeny Test Bulls



Looking at trends in EBI value for cows and progeny test sires (Table 3.14 and Figure 3.6), indicates a steady increase in the average EBI of dairy animals during the past 20 years, from a value of -€18.0 for cows born in 1986 up to a value of €31.8 for calves born in 2004. This represents an increase in EBI value of some €2.6/year (€5.2/year when considering all of the genes of the animal) for the period. Similar trends are apparent for progeny test bulls, although the average EBI of this group is slightly higher, reflecting the fact that these animals are somewhat more selected (Figure 3.6).

Whilst these levels of genetic gain are delivering considerable benefits to the dairy industry (in the order of €5-6 million /annum), they are substantially less than what could be achieved from an optimal breeding program testing 100 high EBI bulls/year (the genetic gain in this scenario has been estimated to be in the order of €25 million /annum).

Table 3.15 Genetic Trends in Holstein Friesian Cows for EBI, Milk Production and Fertility Traits

Year	Cows	EBI	PD Milk Kg	PD Fat Kg	PD Ptn Kg	PD Fat%	PD Ptn%	PD CI Days	PD Surv%
1986	35,742	-€18.0	-183	-8.3	-6.6	-0.03	-0.01	-2.0	0.0
1987	37,902	-€18.3	-186	-8.1	-6.6	-0.02	-0.01	-1.9	0.0
1988	41,610	-€16.9	-185	-7.7	-6.4	-0.01	-0.01	-1.9	0.0
1989	50,976	-€15.7	-172	-6.8	-6.0	0.00	-0.01	-1.7	0.0
1990	57,969	-€11.8	-140	-5.4	-5.0	0.00	-0.01	-1.5	0.0
1991	65,443	-€5.7	-108	-3.8	-3.7	0.01	0.00	-1.4	0.0
1992	67,571	-€2.8	-97	-3.3	-3.3	0.01	0.00	-1.5	0.1
1993	77,613	€0.8	-71	-2.5	-2.3	0.01	0.00	-1.5	0.0
1994	87,420	€2.8	-32	-1.1	-1.0	0.00	0.00	-1.1	-0.1
1995	92,317	€5.0	2	0.0	0.0	0.00	0.00	-0.9	-0.1
1996	106,667	€8.1	32	1.2	1.0	0.00	0.00	-0.7	-0.1
1997	104,922	€12.5	61	2.2	2.2	0.00	0.01	-0.5	-0.1
1998	94,067	€16.2	88	3.2	3.3	0.00	0.01	-0.4	-0.1
1999	89,419	€21.5	108	4.0	4.1	0.00	0.01	-0.4	0.0
2000	89,157	€24.4	125	4.3	4.7	-0.01	0.01	-0.4	0.1
2001	90,693	€25.6	137	4.8	5.3	-0.01	0.02	-0.2	0.1
2002	102,950	€25.6	149	5.2	5.6	-0.01	0.01	0.0	0.1
2003	104,965	€27.6	150	5.3	5.7	0.00	0.02	-0.1	0.2
2004	49,523	€31.8	139	5.6	5.9	0.01	0.03	-0.3	0.2

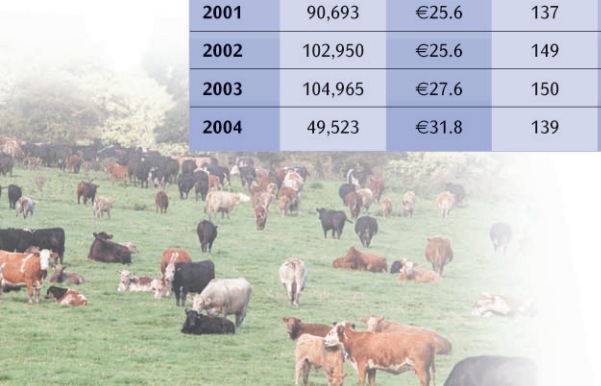
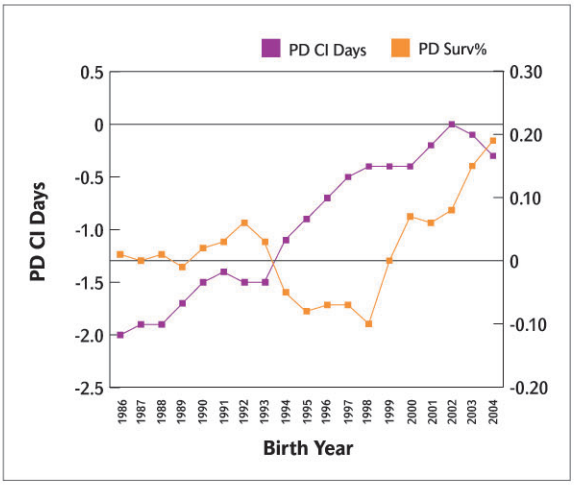


Fig 3.7 Genetic Trends in Calving Interval and Survival for Holstein Friesian Cows



Looking at trends for traits within the EBI index (Table 3.15) indicates a steady improvement in milk solids (fat + protein kg), from a low of –14.9 kg for cows born in 1986 to a high of +11.5 kg for calves born in 2004 (+3.1 kg/year when considering all the genes of the animals). Trends for calving interval and survival are somewhat different, and indicate a definite decline in calving interval and survival for cows born in the early to late nineties (calving interval was increasing by some 0.3 days/annum during this period). However, more recent trends would suggest that both of these traits have started to improve, with survival showing an increase of +0.6% (in breeding value terms) since 1998 and CI and decrease of – 0.6 days (in breeding value terms) since 2002.

Chapter 3 – Breeding Scheme Design and Genetic Gain
(v) Genetic Improvement in Beef Breeds

- *Sustained improvement in muscle and skeletal EBV within the Limousin, Charolais and Simmental breeds*
- *Different ranking across beef breeds for conformation, fat cover and kill-out%*

Three herdbooks are currently involved in the collection and genetic evaluation of linear score data for their members. These are the Charolais, Limousin and Simmental herdbooks (Section 2). Looking at genetic trends in EBV for muscle and skeletal within each of these breeds indicates substantial improvement in these traits, (Table 3.16, 3.17 and 3.18). For example, within the Charolais breed, EBV for muscle has increased from 95.4, for animals born in 1992, to 108.9 for animals born in 2003, an increase of some 1.1 units/year for the 12-year period (Figure 3.8). Similar results are evident for skeletal EBV, although the rate of improvement has not been as marked (+0.6 units/year)

Trends within the Limousin breed (Figure 3.9) indicate similar levels of genetic improvement for muscle (+1.1 units/year) and slightly higher levels of improvement for skeletal (+1.0 unit/year). Trends within the Simmental breed are also consistent with both the Charolais and Limousin breeds, although the focus in this breed appear to be more towards muscle improvement, especially in latter years.

Fig 3.8 Genetic Trends for Muscle and Skeletal in Charolais Breed (1992 – 2003)

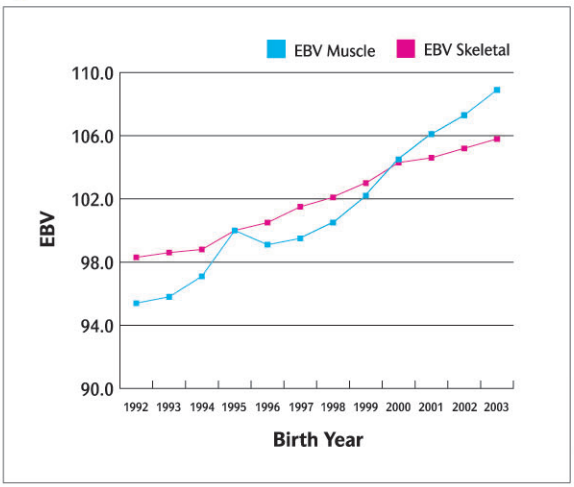


Table 3.16 Genetic Trends for Muscle and Skeletal in Charolais Breed (1992 – 2003)

Birth Year	EBV Muscle	EBV Skeletal
1992	95.4	98.3
1993	95.8	98.6
1994	97.1	98.8
1995	100.0	100.0
1996	99.1	100.5
1997	99.5	101.5
1998	100.5	102.1
1999	102.2	103.0
2000	104.5	104.3
2001	106.1	104.6
2002	107.3	105.2
2003	108.9	105.8

Fig 3.9 Genetic Trends for Muscle and Skeletal in Limousin Breed (1992 – 2003)

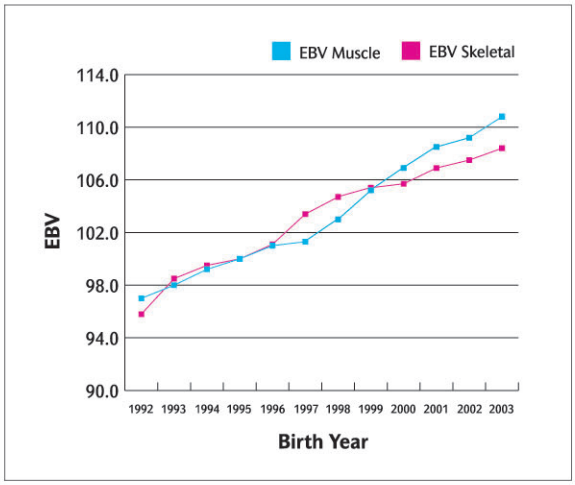


Table 3.17 Genetic Trends for Muscle and Skeletal in Limousin Breed (1992 – 2003)

Birth Year	EBV Muscle	EBV Skeletal
1992	97.0	95.8
1993	98.0	98.5
1994	98.2	99.5
1995	100.0	100.0
1996	101.0	101.1
1997	101.3	103.4
1998	103.0	104.7
1999	105.2	105.4
2000	106.9	105.7
2001	108.5	106.9
2002	109.2	107.5
2003	110.8	108.4

Fig 3.10 Genetic Trends for Muscle and Skeletal in Simmental Breed (1992 – 2003)

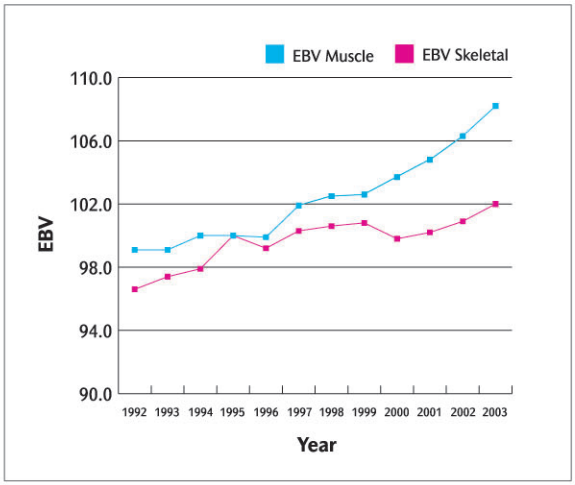


Table 3.18 Genetic Trends for Muscle and Skeletal in Simmental Breed (1995 – 2003)

Birth Year	EBV Muscle	EBV Skeletal
1992	99.1	96.6
1993	99.1	97.4
1994	100.0	97.9
1995	100.0	100.0
1996	99.9	99.2
1997	101.9	100.3
1998	102.5	100.6
1999	102.6	100.8
2000	103.7	99.8
2001	104.8	100.2
2002	106.3	100.9
2003	108.2	102.0

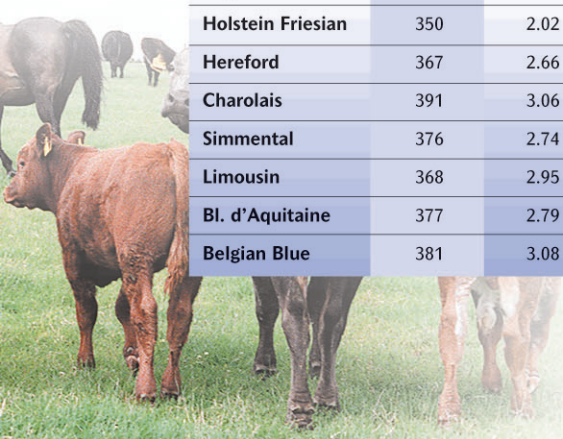
In contrast to genetic evaluations for linear traits (which are within breed), genetic evaluations for AI progeny test data are across breed. This allows animals and breeds be directly compared in the one genetic evaluation system.

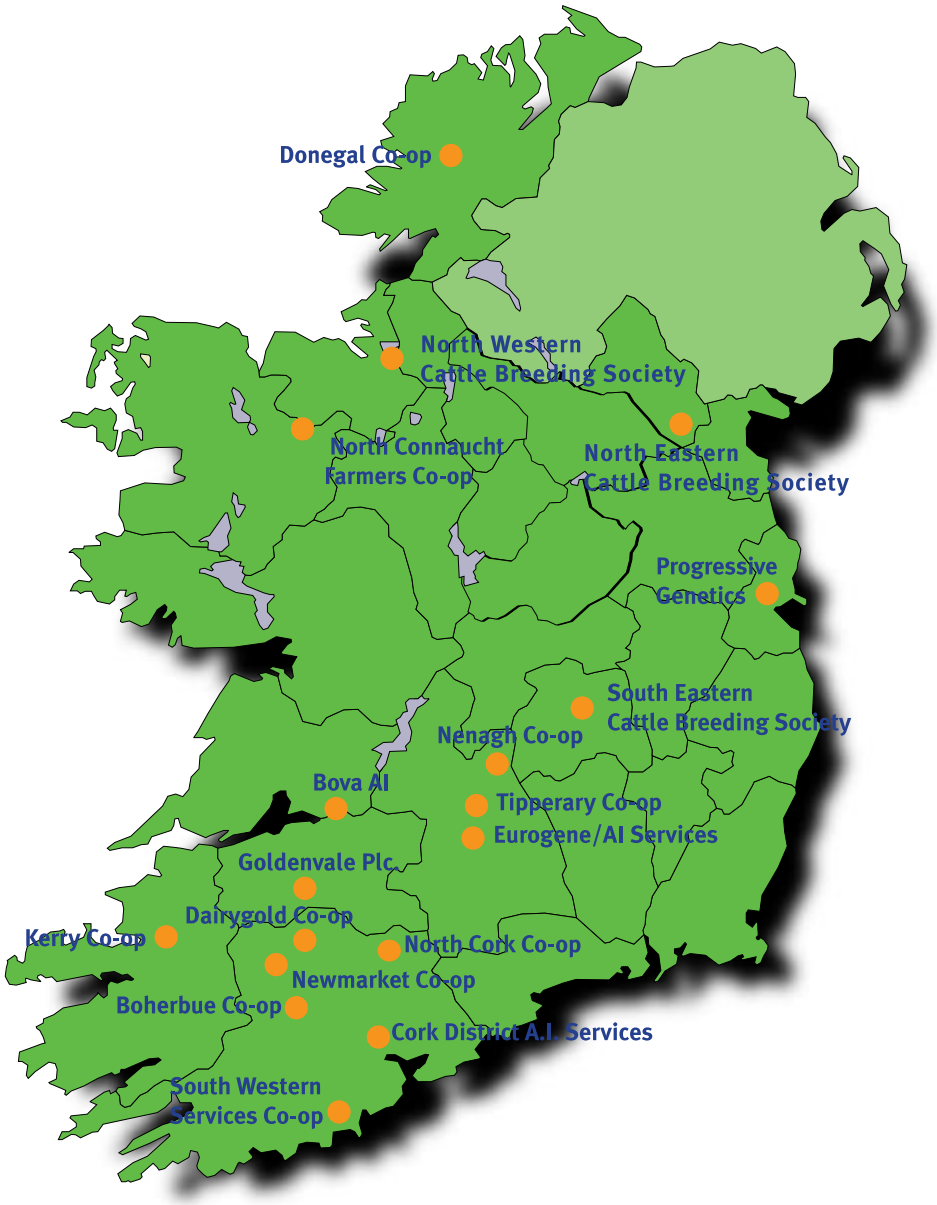
Looking at expected breed differences for each of the traits (Table 3.19) indicates that the Charolais breed is the most superior breed for carcass weight (average carcass weight of crossbred progeny is 391 kg), followed by the Belgian Blue breed (381 kg), and then the Blonde d'Aquitaine (377 kg). Similarly, trends for conformation grade indicate that, based on crossbred progeny performance, the Belgian Blue breed is the leanest breed (3.08 or R grade carcasses) followed by the Charolais breed (3.06), Limousin breed (2.95) and Blonde d'Aquitaine breeds respectively (2.79).

Table 3.19 Across Breed Comparisons for Beef Traits

Breed	Carcass wt.	Conformation	Fat	Kill-out%
Angus	355	2.69	3.82	55.3
Holstein Friesian	350	2.02	3.39	53.9
Hereford	367	2.66	3.95	55.1
Charolais	391	3.06	3.30	55.4
Simmental	376	2.74	3.35	57.0
Limousin	368	2.95	3.26	56.7
Bl. d'Aquitaine	377	2.79	2.97	57.7
Belgian Blue	381	3.08	2.99	56.7

A different ranking order is apparent for fat class, with the Hereford breed resulting in animals in the highest fat class (3.95), followed by the Angus (3.82) and Holstein Friesian breeds respectively (3.39). Trends for kill-out% are similar to those for conformation, with the Blonde d'Aquitaine (57.7%), the Simmental breed (57.0%) and the Belgian Blue breeds (56.7), being the three breed that are expected to result in crossbred progeny with the highest kill-out%.

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