

Shetland Cattle: Breed Analysis Report; December 2017

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2016 may have been a memorable year in the political arena, but it also was a year to remember for the fortunes of Shetland cattle. The herd book contained registrations of 265 calves, and even when the figures were adjusted for animals born in previous years there still were 231 calves to be analysed. It is possible more will appear as late registrations in a future year (the average is 20-25) and the graph below (Figure 1) should be both an encouragement and a tribute to breeders. The flat line of 'Entries birth year' during the 7 or 8 years up to 2013 has taken an upwards turn in the last three years.

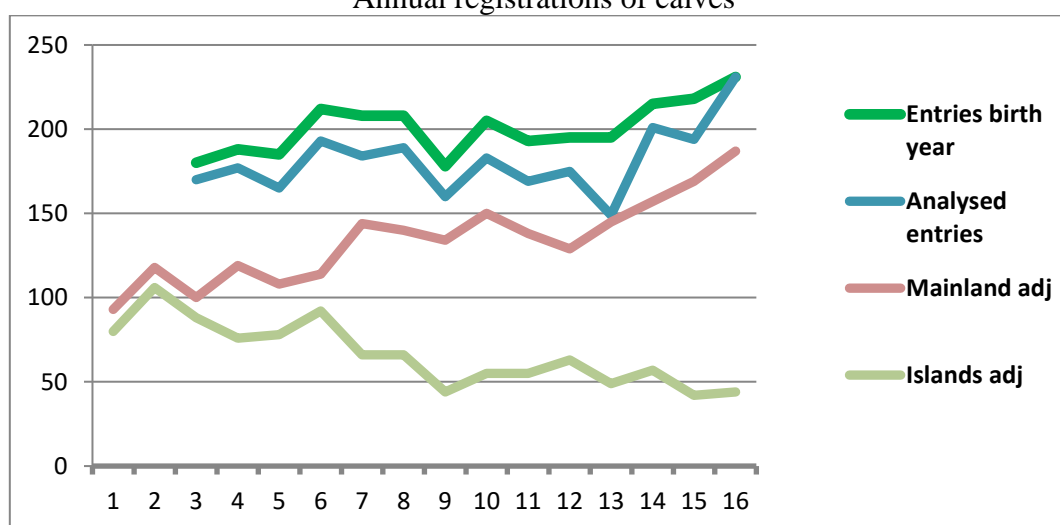
Population trends

The overall strength of the breed is shown best by the number of entries by year of birth which takes into account late entries (Figure 1). Late entries are maybe 10% of the total. They do not contribute to the initial analysis carried out by Peter Hardman and ideally all animals would be registered in their year of birth. However, that does not significantly influence the results of the analysis or the lessons to be learned.

Annual registrations on the UK mainland show a remarkably positive trend. They have virtually doubled since we started the current analyses in 2001. There have been small fluctuations from year to year, notably in 2012 (for reasons unknown), but the graph has surged upwards in the last four years.

Registrations from Islands herds fell dramatically by 50% between 2006 and 2009. They have stabilised subsequently but remain at a vulnerable level. As a result, the genetic structure of the breed is being driven increasingly by herds on the UK mainland. Care will need to be exercised to ensure the geographical shift does not change the character of the breed.

Figure 1
Annual registrations of calves



Annual calf registrations are the best indicator of a breed's security and current results indicate a national herd of maybe 900 breeding cows.

Genetic analyses

The report last year noted the valuable input of those members who developed the databases which enable access to useful genetic analyses. They are available on both the SCBA website (inbreeding and coefficient of coancestry for individuals and groups under the heading of 'kinship analysis' – relationship between animals) and the SCHBS website (kinship analysis which lists the relationship of each bull to all other extant bulls). I was encouraged by these developments, but also expressed some reservations. In particular I was concerned by the concept of limiting the use of some bulls. There seems no justification at this point for limiting the use of a good bull on the lists. The proviso is that he must be a good bull! It is important to be aware of the danger of a genetic bottleneck as monitoring of Templeton Boris and Collafirth Rasmie in these reports has shown, but no current bull falls into that category.

The 'kinship' concept is in vogue at present. It has value but only as part of a wider policy and therefore I feel it is relevant to reiterate the advice from the report last year. "It is very easy to adopt the 'kinship' concept unconditionally and apply it as a priority to control inbreeding, but it is wise to keep its application in context and realise that too much focus on the control of inbreeding may be counter-productive. An effective breeding programme will recognise the potential benefits of linebreeding (i.e. the acceptable method of inbreeding) and the value of using bulls of special value even if they have a relatively high kinship score."

The genetic health of a breed obviously is determined by selection of functionally efficient breeding stock, but in tandem it should maximise the retention of the genetic diversity of the founder population as measured by GCI. Selection of a herd sire will be based on his quality (type, or progeny type if they are on the ground) and on his ability to balance the founder lines.

GCI

GCI measures the effective contribution of founder animals to the current population taking into account the variation in contribution from different founders. GCI has been measured since 2002 (Table 1) and continues to show a healthy level in comparison with other rare breeds, although a slight decline is evident. It is too slight to cause concern but justifies ongoing monitoring.

Table 1
Loss of Founders 1981-2014

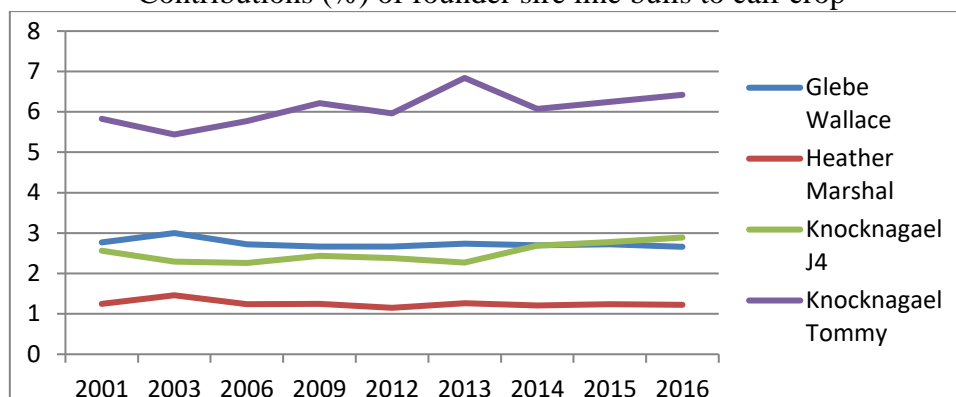
| Measure | 1981 | 1999 | 2002-5 | 2006-9 | 2012-5 | 2016 |
|-------------------------------|------|------|--------|--------|--------|-------|
| Active ancestors and founders | | 798 | 909 | 1056 | 1386 | 1550 |
| Active male founders* | 28 | 25 | 25 | 25 | 25 | 24 |
| Active female founders* | 66 | 53 | 47 | 48 | 48 | 48 |
| Total active founders* | 94 | 78 | 72 | 73 | 73 | 72 |
| GCI | | | 32.63 | 31.59 | 31.57 | 30.67 |

*figures may vary slightly from earlier versions as a result of recent update

Bull line founders and HB Volume One representatives:

Figures 2 and 3 continue to be included as reference points. Contributions of the four founder bulls (Figure 2) and the Volume One (1981) representatives (Figure 3) have remained relatively constant. Knocknagael Tommy has the greatest influence among the 'Founder line' bulls, and his influence is increasing gradually, but it is not a matter for concern.

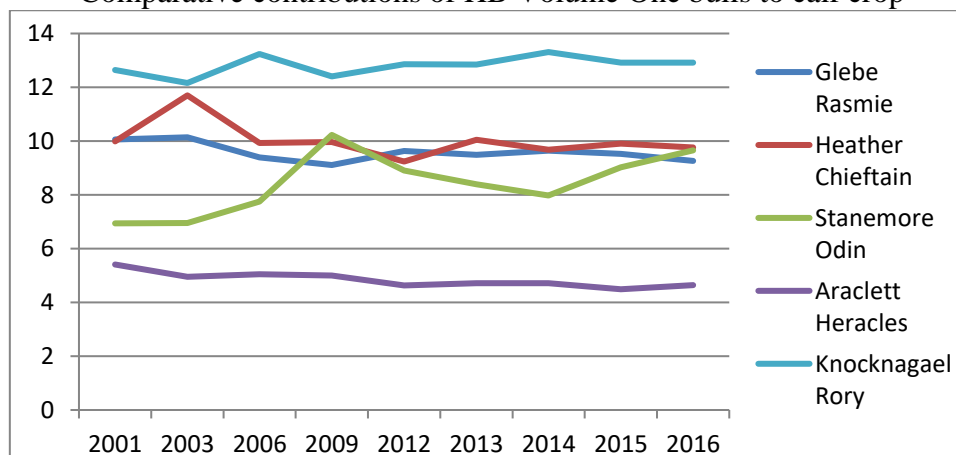
Figure 2
Contributions (%) of founder sire line bulls to calf crop



The bulls shown in Figure 2 are used as markers to illustrate trends as they are the founders of the four sire lines, but other founders also are important. Two bulls, Foula Dandy and Garths bull (sire of Araclett Pandrop), almost have the same influence as Tommy. Some founder cows also exert a strong influence; two Knocknagael cows, A1 and C1, gain their status as ancestors of Rory, while Glebe Hebe and Setter Blackie made a large contribution to the Araclett influence.

There is good balance of influence among the bulls which are the representatives of the four lines in the Herd Book (Figure 3). Glebe Rasmie, Heather Chieftain and Stanemore Odin cluster closely. The Araclett line is not so straightforward for reasons stated in the last review, but an average between Rory and Heracles gives a figure comparable to the other lines.

Figure 3
Comparative contributions of HB Volume One bulls to calf crop



Note: The contributions shown in Figures 2 and 3 are for comparative purposes only between animals in each Figure. They cannot be compared with the % figures in other Tables.

Rasmie and Boris

The dangers arising from the popularity and overuse of Collafirth Rasmie (92.1540) and Templeson Boris (93.1680) continue to recede. Although their influence is significant it no longer is an immediate threat (Table 2). This is due partly to the increasing influence of herds on the UK mainland where the Rasmie/Boris factor has never been so severe.

Table 2
Changing influence of C. Rasmie and T. Boris 2012-2015

| Bull | Location | 2012 | 2013 | 2014 | 2015 | 2016 | %+/- |
|-------------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Collafirth Rasmie | Islands | 8.13 | 7.83 | 6.96 | 5.09 | 6.57 | -19.2 |
| Collafirth Rasmie | Mainland | 2.93 | 2.83 | 2.79 | 3.28 | 3.17 | +8.2 |
| Templeson Boris | Islands | 8.28 | 8.76 | 6.56 | 5.39 | 5.24 | -36.7 |
| Templeson Boris | Mainland | 3.39 | 2.90 | 2.97 | 3.27 | 3.20 | -5.6 |

It has been a valuable exercise to follow the variation in contribution by Rasmie and Boris. The warnings of the danger of a genetic bottleneck hopefully played some part in bringing the situation under control and allowed the useful traits of the two bulls to be integrated without endangering the genetic health of the breed.

Influence of young bulls on 2016 crop of calves

Mainland

The young bulls most prominent as sires of the 2016 crop of calves in Mainland herds (Table 3) show less evidence of Heather, Glebe and Hillwell influence than in the previous year but it still is significant. Templeson Victor and Carn Bhren Fionn both are Glebe line bulls. St Trinians Jock is Glebe line and carries a high level of Boris/Rasmie. Three bulls with interesting credentials are no longer available but hopefully will have sired calves in the 2017 crop. The red-and-white bull, Blazefield Rufus, has been recommended in previous reports and deserved opportunities to leave plenty of progeny. Windgates Zorro (low level of Boris/Rasmie) and Challenger Artemis (decent balance of lines) seem to have been used lightly and also justified more chances.

Table 3
Contribution of young bulls to 2016 crop of calves on the Mainland
(2015 figure in brackets)

| Bull | Born | Contribution | Notes |
|----------------------|-------------|---------------------|---|
| Templeson Victor | 2013 | 2.41 (nil) | |
| Carn Bhren Fionn * | 2011 | 2.01 (1.64) | High Heather %; son of Gillarunna Nocturne |
| Blazefield Rufus * | 2012 | 1.74 (0.66) | Good bull; reviewed previously; R & W |
| St Trinians Jock * | 2011 | 1.60 (2.30) | Hillwell sire line; high level Boris/Rasmie |
| Challenger Artemis * | 2013 | 1.60 (nil) | Good balance of lines |
| Welland D Flodden | 2014 | 1.60 (nil) | Linebred; very low level Boris/Rasmie |
| High Tor Oxlip | 2012 | 1.60 (0.99) | |
| Windgates Zorro * | 2013 | 1.60 (0.33) | Good blend of lines; low level Boris/Rasmie |

*Animals marked * are believed to be dead.*

Islands

The report last year noted the dominance of the Heather line in Islands herds, with particular reference to Raymond and Lulach. This report finds the same situation, but probably even more intense. Twenty-one bulls are listed as sires of the 2016 crop and/or sires retained for use. Twelve were from the Heather sire line with most of the others from the Glebe line. Inevitably that has led to an imbalance between lines. Among the six most influential young sires of the 2016 crop (Table 4), only North House Frosty was not from the Heather line but he was compromised by the high level of Boris/Rasmie in his pedigree.

Table 4
Contribution of young bulls to 2016 crop of calves on the Islands
(2015 figure in brackets)

| Bull | Born | Contribution | Notes |
|--------------------|-------------|---------------------|---|
| Collafirth Louis | 2013 | 10.23 (12.86) | Son of Raymond; Hillwell on dam side |
| L'thorpe Raymond * | 2010 | 8.24 (16.43) | Very concentrated Heather influence |
| Geldron Blett * | 2013 | 5.68 (2.86) | Son of Lulach; high level Boris/Rasmie |
| Geldron Brydon * | 2013 | 4.55 (nil) | Son of Lulach; very high level Boris/Rasmie |
| North House Frosty | 2013 | 3.41 (1.43) | High level Boris/Rasmie |
| Collafirth Tyson | 2013 | 3.41 (nil) | Low Boris/Rasmie |

Please note again: these contributions are for comparative purposes only between the animals in Tables 3 and 4. They can not be compared with the results in Figures 2 and 3.

Future Policy

The analyses above can be used to identify opportunities to improve the quality and value of Shetland cattle while maintaining the diversity necessary for ongoing health of the breed. A balanced approach is appropriate.

Recommended bulls used in 2016 or intended to use later

I obtained information on 120 bulls that were used in 2015 or expected to be used thereafter. Rather more than half of them are based in herds in England and Wales, with others divided between Scotland and the Islands.

Islands

The report last year drew attention to two young bulls that had potential to correct, or at least counter-balance, the increasing dominance of the Heather line.

Collafirth Tyson (2013) was used in 2016 and hopefully has been kept in service in 2017. Although he belongs to the Heather sire line, he has strong redeeming features. As noted previously “his dam was 11 years old when he was born. He has Hjem Lowrie, Troswick Beach and Collafirth Jamie close up in his pedigree; he reduces the level of Knocknagael Rory; and Collafirth Rasmie and Templeson Boris are almost absent from his pedigree.”

Trondra Einar (2015) has not yet appeared in the lists, but hopefully has been retained and put to work. He has a good balance of the four main lines plus some other useful elements. Boris is absent from his pedigree and the input of Collafirth Rasmie is negligible. His dam also was 11 years old when he was born; he comes from a quality Trondra cow family founded by Inga (1982) and reinforced by mating with Murrister bulls (Olympus and Pete) in the next two generations.

Another Collafirth bull, **Collafirth Odin** (2016) deserves an opportunity to show his quality, although there is rather too much Rasmie in his pedigree. He comes from the Araclett line and is a son of St Trinians Balou.

High levels of Boris/Rasmie are found in bulls which have been used but are no longer available. They include Geldron Brydon and Geldron Craetir (both 25%), Ocrquooy Invictus (21.29%), Rockytoon Demo and Geldron Blett (both 19.53%). Similar levels are found in bulls that still are in use, such as Ocrquooy Haldor (22.65%) and Ocrquooy Imperio

(18.76%). There also is danger of further concentrating the Heather influence through Collafirth Louis which currently is an influential bull.

Scotland

The bulls used, or expected to be used, on the mainland of Scotland still show a dominance of Heather and Glebe genetics. Heather is the most powerful influence, as it is in the Islands, but the majority of bulls come from the Glebe sire line. Therefore, attention can be directed profitably to the other lines.

Two young bulls, **Carn Bhren Inuus** (2014) and **Carn Bhren Irish** (2014) were recommended last year and both remain in service. Inuus is a brown/brindle from the Araclett line, while Irish is red and from the J4 line. A younger red-and-white bull, **Stenscholl Paddy** (2016) which is a son of Irish, has joined the lists this year, and also can significantly balance the lines.

The superior quality of two older bulls, **St Trinians Balou** and **Trondra Arrow**, has been noted previously and their availability through natural service now is augmented by their addition to the team of bulls on the A.I. stud. St Trinians Balou, an excellent sire, comes from the Araclett line and boosts J4 influence, while Trondra Arrow (J4 line), noted for his superb quality and temperament, is by Collafirth Laxness and out of a cow from the same Trondra Inga family as Einar (see above). There is no Boris in his pedigree, and only very little Collafirth Rasmie.

On the other hand there are some bulls which have a high level of Boris/Rasmie (Renwick Renoir 20.71%, Geldron Aert 41.41%) and others which increase the Heather influence (Glachbeg The Laird and Carn Bhren Isak) or the Glebe influence (Torroboll Arnie). Care should be exercised in the use of these bulls.

England/Wales

Selection from a list of 44 bulls gives breeders in England and Wales a very broad choice. In general there is a fairly good balance between the main lines, and the Boris/Rasmie problem does not pose a serious problem currently. However, the Heather/Glebe emphasis in some sires of the 2016 crop, which accentuates the imbalance in Scotland and the Islands, does indicate caution in the use of several bulls such as Carn Bhren Guga, Cross Reguill Adam, Greenoak Neo, Hengistbury Acer, High Tor Oxlip, Perricks Acorn, Rowland Duncan, Rowland Mungo, Templeson Victor, Torroboll Archie, Wellback Alfred and Wharncliffe Jacob. It would be prudent to give attention to bulls with a stronger element of Araclett and Knocknagael. Breeders have the opportunity to select a bull suited to their particular purpose, and I have noted below a few bulls that are worthy of a place as a herd sire.

Blazefield Rufus (2012) no longer is available but his red-and-white son, **Wharncliffe Kyle** (2014) can take his place. Kyle was recommended in the previous report and is out of Wharncliffe Grace with only a slight infusion of Collafirth Rasmie and Templeson Boris through her grand-dam. Three other sons of Rufus also merit attention, namely red-and-white **Wharncliffe Jack** (2013), **Whinpot Jackdaw** (2016) and **Whinpot Red Adair** (2016). All these bulls are able to influence the balance between lines to give a better structure as they limit the influence of Heather genetics and have a low level of Boris/Rasmie.

Also strongly recommended in the previous report were **Welland Down Flodden** (2014) and his son, **Wild Meadows Charles** (2016). Both are particularly interesting and valuable

because they have lower levels of Heather influence and negligible levels of Boris/Rasmie. They both are available for use. The carefully planned breeding of Charles is Welland Down both sides with several lines tracing back to J4 (Knocknagael), and Flodden's dam traces to Trondra Inga, a notable cow of mainly Araclett breeding.

Several other bulls merit mention including **Blazefield Beano** (grandson of Waterloo Charlie) and his son **Oxmoor Donn Carr**, **Cwrdu Morgan** (son of St Trinians Lawrie), **Lincwold Fergal** (son of Tivis Hill Keen) and **Randolph Maximus** (the only bull of the Araclett sire line listed in England and Wales).

A.I. bulls

There are now 14 bulls available through A.I., 9 from SCHBS and 5 from RBST. It seems to give a wide choice but there are unusual features which require mention. None of the A.I. bulls belongs to the Heather sire line, and yet their pedigrees are dominated by Heather genetics. The 9 bulls in the SCHBS stud have a very high concentration of Glebe and Heather ancestry and, as noted previously, the combined Heather/Glebe influence is almost twice as high as that of the combined Araclett/Knocknagael lines. Hengae Fearsome, Randolph Fergus, Boquhapple Kelvingrove, Ocrquooy Haldor, North House Frosty and North house Victor are particularly culpable. Fortunately there are some bulls within the stud able to correct this imbalance, and therefore **St Trinians Balou** (SCHBS), **St Trinians Mansie** (RBST), **Stanemore Odin** (RBST) and **Trondra Arrow** (SCHBS) should be high on the agenda.

It also should be noted that some of the bulls have a heavy input from Collafirth Rasmie and Templeson Boris. Therefore, Ocrquooy Haldor (22.65%), Renwick Renoir (20.71%), North House Frosty (16.80%), St Trinians Agamemnon (12.50%) and North House Victor (11.33%) should be used sparingly.

Summary

The results for 2016 generate a feeling of justified optimism. The increase in the number of registrations can no longer be treated as a blip. There has been a clear upward trend for four years. The breed is expanding and, judging by the animals coming through the system, quality is improving. Although there are variations in different parts of the UK with some danger of Heather influence over-balancing the population, there is overall a healthy balance between the major lines with effective and encouraging survival of existing founder genetics. All point to the successful maintenance of a secure genetic base. The danger of a genetic bottleneck, which used to be red alert, now is revised to watchful monitoring. There are signs the decline in the Islands population may have levelled out, but the increasing proportion of the breed kept on the UK mainland (now maybe more than 80% of the total) places a great responsibility on the shoulders of breeders in those areas to maintain the genetic health of the breed. The evidence of recent years indicates they will not be found wanting but, and it is a big 'but', a preview of 16 bull calves registered from UK mainland herds in 2017 is disappointing. It exposes a heavy influence of Heather genetics, and Glebe to some extent, and potentially could be a significant step backwards from the positive current assessment. Bulls such as Rowland Frasier, Treetops Obsidian, Wharncliffe Nelson, Beechcroft Django, Treetops Oscar, Treetops Oliphant and Little Wyld Barry are the main culprits. None of the bulls helps to balance the lines but Hollington Lancelot, Little Wyld Barny and Wharncliffe Norbert maybe are the best.

Once again I'm grateful for the input of all those who have assisted in providing the information necessary to prepare the report, especially Peter Hardman who does the initial number crunching. Information on bulls used in 2016 (and intended to use in 2017) is particularly helpful and the work of Paddy Zakaria in the northern areas and Alan Yarker and Barry Allen in England and Wales makes my task much easier.