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Native Irish cattle breeds and their fight against extinction

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2. List of abbreviations

AI = Artificial Insemination

CAP = Common Agricultural Policy

DAD-IS = Domestic Animal Diversity Information System

EFABIS = European Farm Animal Biodiversity Information System

EU = European Union

FAnGR = Farm Animal Genetic Resources

GLAS = Green, Low Carbon, Agri-Environment Scheme

KCSI = Kerry Cattle Society of Ireland

RBST = Rare Breed Survival Trust watch list.

REPS = Rural Environment Protection Scheme

3. Introduction and aim

The Irish Moiled (Irish Maol), Kerry and Dexter cattle are the rarest cattle breeds native to Ireland. These breeds were all popular throughout Ireland in the 1800's in various types of habitats and thrived on the ground of the hill farmer as they are hardy dual purpose breeds with the exception of the Kerry which is a dairy breed.

However, changes in the agriculture industry with the advances in technology and machinery have had an impact on these breeds. The Irish farming economy is mainly comprised of beef and dairy production. With the introduction of more specialist dairy and beef breeds from the continent, numbers of these native breeds began to decline (Table 1). These breeds are currently on the endangered breeds list (EFABIS).

During the course of my thesis work, my goals are to review research papers, books and journals on my chosen topic to see how these breeds could become extinct and why they should be conserved. Also, to examine the conservation methods of these breeds being used. The desired outcome of this thesis work is to see that the conservation methods are effective to improving the numbers of these rare breeds and that we do not lose potentially vital genetic resources and that biodiversity is maintained.

4. Literature review

4.1 The rare breeds

4.1.1 Irish Moiled

The Irish Maol or Moiled cattle are a traditional Irish breed which has been thought to exist in Ireland since as early or before the fifth century (Curran, 1990). Early historical records of the Irish Moiled are vague however the “Moile” part of the breeds name means polled or hornless and many references were made to the existence of polled cattle in Irish epic tales such as that of the Ulster Cycle (O Cadhlaigh, 1956). These tales belonged to the La Tene period which supports the early existence of this ancient breed in Ireland. Many tales referred to ancient sites such as the Hill of Uisneach in Co. Westmeath which was occupied by the ancient Celts from as early as 150AD. Celts also occupied the Lagore Crannóg near Dunshaughlin from 650AD. The Celts were present in both sites up until the late La Tene period. Findings resulting from the excavation of these sites included skulls which resembled that of hornless type cattle. This evidence suggests that a breed or type of polled cattle existed in Ireland from the fifth century onwards and perhaps even earlier.

The Irish moiled is a polled breed. The name of the breed comes from the Irish word “maol” which translate as bald or hornless. They are a dual-purpose breed reared for both beef and milk production.

They are predominantly red in colour and have a marking of a white line along their back and white under their belly with red ears and a red nose (Figure 1). The face should be mottled and should be rectangular in shape. The neck should not be too short and should blend in well to the shoulders. They have a dome shaped head. The animal is less likely to carry the horned gene with this shaped head. The old breed had quite prominent eyes. This however is being discouraged as it gives rise to conjunctivitis.

They are a medium sized breed and can weigh up to 650kg. Bulls can weigh up to 800kg. This is the breed standard from the Irish moiled society. The breed has shown resilience to survive on large amounts of low quality forage and it has been said that they have a ‘big bellied’ appearance due to this way of feeding.



Figure 1 Irish Moiled cow
Image sourced: [thatsfarming.com](https://www.thatsfarming.com)

4.1.2 Kerry

The Kerry cattle breed is believed to be one of the oldest breeds in Europe. Kerry cattle existed as a prevalent breed of cattle in Ireland until the 17th century. After this point, pure bred Kerry cattle became fewer and concentrated in numbers to the poorer south-western regions of Ireland (Medlycott, 2000). It has an ability which allows it to not only survive but thrive on the harshest of terrains. They provided some invaluable resources for Irish people to survive.

A benefit of the breed's its ability to produce high quality milk from a diet which mainly consisted of roughage (Alderson,1981). A Kerry cow is black in colour (Figure 2) and with perhaps a little white on the udder (Curran, 1990). Kerry cows can reach 360 kg whereas the bulls can reach 570kg in weight. The average height for cows stands at 125cm from the withers and can calve regularly, even up to 14 and 15 years of age. The average milk yield is between 3000 and 3700kg with 4% butterfat content. The globules of butterfat in Kerry milk are much smaller than those found in other breeds which makes it easier to digest. There are several cows that are capable of yielding over 4500kg.

In 1890 the first Kerry cattle herd book was issued and it recorded 118 Kerry bulls and 942 Kerry cows. The Royal Dublin Society have worked to promote and maintain this herd book until 2001 and then the Kerry Cattle Society of Ireland (KCSI) which was founded in 1917 has taken over their role. These efforts aimed to develop a conservation strategy to achieve conservation of genetic variation and minimisation of inbreeding. The scheme's strategies involved annual semen collection from desirable bulls, embryo cyroconservation from cows and the development of a computer based system with the ability to analyse.



Figure 2 Kerry cow

Image sourced: 1st stop County Kerry

4.1.3 Dexter

Dexter cattle are a breed of miniature cattle originating in Ireland. The Dexter is a small breed with mature cows weighing up to 350kg and mature bulls weighing about 450kg. They are solid and compact in appearance. Considering their small size, their body is wide and deep with well-rounded hindquarters. Two body conformation types are found within the breed. One of the types is cattle with normal bodies and very short legs, and the other type is cattle that are proportionately small in every dimension.

Dexter's can come in 3 different colours, black, dun(brown) and red. (Figure 3) Dexter's should have no white markings except for some very minor white markings on the belly, udder behind the navel and some white hairs in the tail. While many Dexter's are naturally hornless, many have horns that are rather small and thick and grow outward with a forward curve on the male and upward on the female. The Dexter's can also thrive on the harshest of terrains.

Cows can begin mating at around 15-18 months of age, and can calve into their mid-teens. They are easy calvers although great care should be taken when crossing with continental cattle. Their lifespan is usually about 25 years in total. The breed is a dual purpose breed and is suitable for beef or milk production. Dexters can produce over 3500 litres per lactation. Their milk has a butterfat content of 4%, with protein levels of about 3.5%.

Dexter beef has good marbling. This allows for tender and flavoursome meat. Their carcasses weigh about 145-220kg, and despite their small size, they can often achieve a killing-out percentage of well above 56%. This is due to a good ratio of meat against waste products like fat and bone.



Figure 3 Dexter bull. Image sourced: www.dextercattle.co.uk

4.2 Why should rare Irish breeds be protected from extinction?

The rare Irish cattle breeds have many genetic traits which are beneficial. In Ireland, you are not allowed to have animals with horns under the S.I. No. 224/2014 - Animal Health and Welfare (Restriction on Horned Cattle) (No. 2) Regulations 2014. Therefore, the Irish Moiled cattle are desirable as they are naturally polled. This is advantageous to farmers as they do not have to carry out the dehorning procedure and is therefore less expensive. Their animals would be suitable for sale and for export. A horned animal can cause problems to other livestock in their yard and this factor is eliminated also.

Milk yields of 4500 -6500 can be achieved from forage based systems. Butterfat content averaging above 4% and a protein content of 3.3%. Moiled cows have been noted to 'feed off their backs' in order to give their offspring as much help as possible in the early stages of life. Their beef is renowned for its tenderness, marbling and flavour. Steers can be fattened on good quality forage without concentrates and achieve carcass weights of 220-260kg with a EUROP grade of R and O which is good and fair under the EU Beef carcass classification scheme. Kerry and Dexter cows have milk with a high butterfat content that is suitable towards the production of cheese and ice cream. Dexter beef also has good marbling.

The Irish Moiled are of interest to suckler farmers as they are considered to have good calving qualities. When crossed with a continental bull they can be easily calved and will produce enough milk to sustain their calf. They produce a bright calf with no horns. If the cow is kept in good condition she will produce a calf every 12 months until at least 10 years of age.

Dexter cows are extremely maternal and because of their dual-purpose qualities they produce good milk. Calving problems are rare and newly born calves are lively.

Heifers mature young and can be mated at 15 - 18 months of age. Dexter's have been noted for their longevity and can breed regularly for 14 years or more.

Kerry calves are easily reared and the bullocks will fatten, though they may take 4 to 6 months longer than other breeds. They make excellent quality beef weighing up to 550 kg.

These native breeds are sound in hoof and leg and are suited to most terrains and temperatures. They have a high resistance to foot problems. In the winter, they grow a thick winter coat. The Irish moiled are a heavy animal so they may poach soft ground in winter time. The Dexter and Kerry are not as heavy so this is generally not a problem. These breeds

also have a high resistance to scour and viral problems. They have very good temperaments and are docile in their nature (EFABIS).

The Irish Moiled and Dexters were found to be effective in controlling a grassland problem caused by *juncus juncus* through grazing (O'Reilly,2012). It has been indicated that traditional breeds may have somewhat greater ability to exploit patches of low quality herbage. Herbage from tall vegetation patches are likely to be more preferred by traditional cattle (Dumont et al., 2007).

4.3 Reasons for the decline of these rare Irish breeds

The main reason for the decline of these rare native breeds is the changes that have been made in the agriculture industry over the last 60 years. Cattle had more functions than to produce food. They were used as draught animals and to produce clothes. Draught cattle breeds are threatened by the expansion of mechanization in agriculture (FAO, 1996).

Farmers have faced many challenges with climate change, rising energy costs, food security and rural decline. Farmers have now opted for a specialised world of modern farming. This is mainly due to the major advances in technology in the last 50 years of selective breeding and improvement of stock. The industry has seen a significant expansion over the last number of years. Ireland is self-sufficient in both major meat and milk products, producing such high quantity levels that they export a lot of agriculture produce (Figure 4). In 2015, Ireland ranked as the 10th largest exporter of dairy products, eggs, honey, edible animal product and 15th for meat and edible meat offal (International Trade Center). With the elimination of milk quotas farmers want the best cows to produce vast amounts of good quality milk. This is something a dual purpose breed is unable to do.

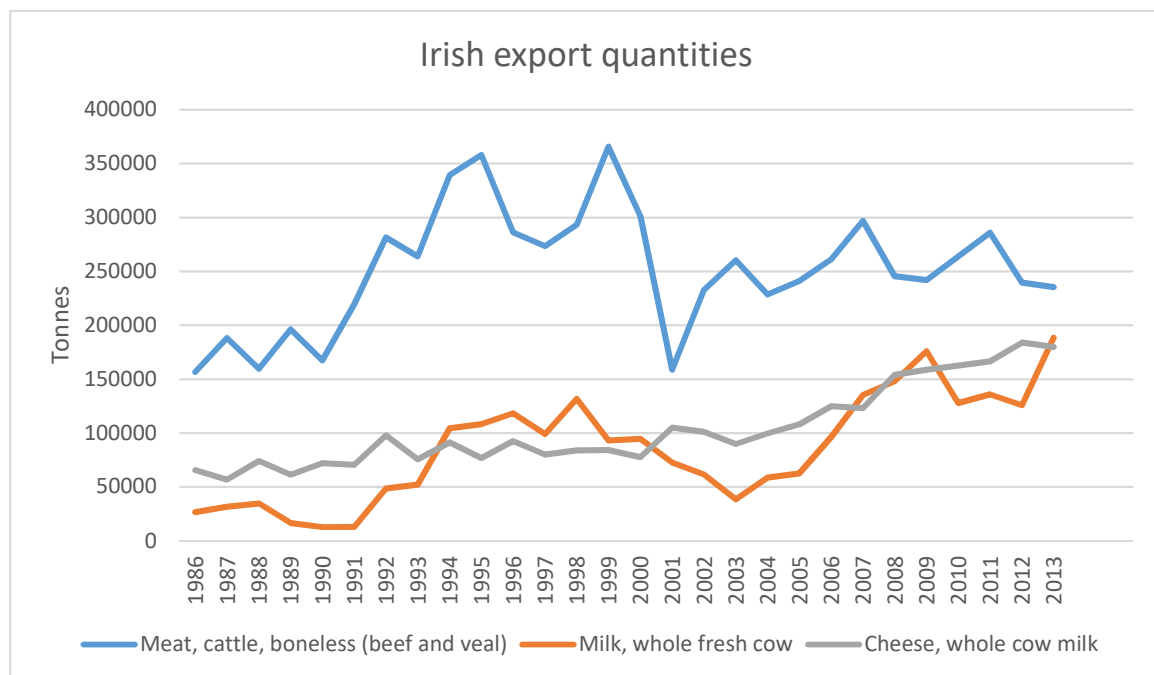


Figure 4 Information sourced from FAO statistics database

The Common Agricultural Policy (CAP) is a system of subsidies and support programmes for agriculture introduced and controlled by the European Union. CAP combines direct payments to farmers together with price/market supports. It currently accounts for about 62% of the EU's budget. This has led to farmers having a preference for the cattle that they rear.

Continental breeds such as Charolais, Simmental, Limousin and Salers are preferred. This was because the continental breeds are known for their large frame size. They have a higher finished weight and correspondingly later finishing age than the British Breeds. The cutability of the carcass is good. There is a good ratio between meat of the carcass and the waste. These animals have rapid weight gains. The continental breeds have been crossed with British breeds that are generally smaller in mature size, reach mature size at an earlier age, have less growth potential, are excellent mothers and excel in fertility and calving ease, attain higher quality grades, and yield carcasses with a lower percentage of saleable product. Farmers prefer these modern, efficient breeds as the native Irish breeds have been unable to compete commercially and have been replaced by these other breeds which are considered to be more suited to an increasingly competitive environment that has been developed within the European Union. Breed extinctions have been most thoroughly documented in Europe and the former U.S.S.R., where the richest countries have lost the highest proportions of their breeds, implying that agricultural development is hostile to breed diversity (Hall *et al.*, 1993).

Another aspect for their decline is problems with breeding. Chondrodysplasia is a congenital anomaly related to defects of the genes that control the chondrogenesis. There are three distinct syndromes known: Dexter, Telemark and Brachycephalic type. The chondrodysplasia Dexter type syndrome is associated to an incompletely dominant gene. There are three recognized phenotypes in this form of disease: severe achondroplasia, with abortion before the seventh month of gestation (monster Dexter), when related to dominant homozygous; chondrodysplasia with limbs shortening, when heterozygous; and normal animals, when recessive homozygous (Wurster *et al.*, 2012)

5.Methods used to repopulate

Conservation genetics is defined as the use of genetic theory and techniques to reduce the risk of extinction in threatened species (Frankham *et al.*, 2002). Conservation genetics also focuses on the consequences which may have arisen from the reduction of once-large outbreeding populations to smaller units which suffer from reduced genetic diversity. Many small threatened populations have reduced genetic diversity or inbreeding present (Frankham *et al.*, 2002). Although these rare breeds exist in relatively small populations, they can make a valuable contribution, both to the livestock industry and to quality of life. They have distinctive characteristics, which have value in protecting the environment, and qualities which make them well suited to less intensive farming methods. Even if farmers think these rare cattle are of no apparent value at present, they may well possess characteristics that will be important in the future.

The current conservation programmes in Ireland is in-situ conservation but it is being complemented by ex-situ conservation. Ex situ in vivo conservation is the safeguard of live animals in zoos, wildlife parks, experimental farms or other specialized centres. Kerry cattle are currently being conserved in a state owned farm called Farnleigh in Dublin, Ireland. Dexter cattle are being cared for at Killenure Castle, Co. Tipperary. Ex situ in vitro conservation is the preservation of genetic material in haploid form (semen and oocytes), diploid (embryos) or DNA sequences.

The Irish Moiled Society promotes the use of embryo transfer. They outline the criteria that they see fit for conservation of the breed. Embryo transfer is seen as a useful procedure to multiply superior animals, and/or to preserve particular female lines, thereby benefiting the breed as a whole. The Society controls the number of calves registered in the Herd Book which are got by Embryo Transfer. All calves got by Embryo Transfer will carry the designation (ET) in the Herd Book. The Society requires members intending to use Embryo Transfer to apply to the Board for permission stating their intentions.

Such as in an emergency, where eggs have been collected by 'after death ovum recovery' at slaughter, the society will accept a retrospective application for consideration.

Or where eggs have been recovered and frozen for subsequent use, application as in paragraph 3 above, should be made prior to fertilization.

The Society will only consider 'Full Pedigree' females as suitable donors.

Each female with authorised permission will have a limit of 15 calves that are allowed to be registered that are got by Embryo Transfer without further approval from the board.

Before a calf produced by Embryo Transfer can be registered it must be Parentage Proven.
(Appendix 4-Embryo transfer)

In the last few years, ex situ in vitro conservation programs of livestock genetic resources have focused interest on cryopreservation of gametes, embryos and somatic cells as well as testis and ovarian tissues, effectively lengthening the genetic lifespan of individuals in a breeding program even after the death (Mara et al., 2007)

5.1 EU programmes

The E.U is involved in conservation activities through two specific Programmes: the Rural Environment Protection Scheme (REPS) and the Programme for Conservation and Utilisation of Genetic Resources for Agriculture (Council Regulation (EC) No. 1467/94) The department of Agriculture, Food and the Marine in Ireland had enforced the REPS supplementary measure 3 from 2000 to 2013 on behalf of the EU. The purpose of this measure was to assist farmers participating in REPS who reared animals of the following native breeds that met with the criteria of Article 39 of Regulation 1698/2005.

Cattle: Kerry
Dexter
Irish Moiled (or Maol)

Equines: Connemara Pony
Irish Draught
Kerry Bog Pony

Sheep: Galway

Payment was made on the average livestock units of registered animals per year, subject to the requirements for participation listed below.

Livestock units for payment purposes were calculated as follows;

Cattle below 6 months	0.4 L.U
Cattle 6 months to 2 years	0.6 L.U
Cattle over 2 years (including cows)	1.0 L.U
Equines over 6 months of age	1.0 L.U
Ewe (+/- Lambs at foot)	0.15 L.U
Ram	0.15 L.U
Ewe Lamb (6 months - 1 year of age intended/kept for breeding)	0.10 L.U

The above Livestock Units equivalents apply when an animal was kept for a full year.

Payment under this supplementary measure was made at the end of the recording year based on the monthly average over the recording year.

Strategies of national gene banks for AnGR in Europe for long term conservation purposes and to support in situ conservation of endangered breeds. In European countries gene bank collections have been established to conserve farm animal genetic diversity, as an important complementary strategy to in vivo conservation. Gene banks usually have long term

conservation objectives, but often they also play a role to support the in-situ conservation of endangered breeds. National gene banks will benefit from exchange of information and knowledge, in order to rationalize and to optimize their strategies.

Requirements for the scheme:

The participant must be an active member of an approved breed society for the duration of the REPS contract.

The participant must maintain an up to date monthly record of all registered animals on the holding.

All female progeny from a purebred mating must be registered with the relevant breed society.

All male bovine progeny from a purebred mating must be birth notified and/or registered as appropriate with the relevant breed society. All male ovine and equine progeny must be registered with the relevant breed society.

All animals eligible for payment must be clearly identified on the farm REPS record sheets. You must remain active as a breeder of the native breed for the duration of the plan.

Annual payment is €200 per livestock unit. All female bovines less than 2 years of age were eligible to be included for payment. An adult female (over 2 years of age) had to be mated to a purebred male of the same breed at each mating and must have produced offspring at least once in the previous 2 recording years to qualify for payment, otherwise these adult females were excluded from the calculation of average LU's over the year. All male bovines less than 3 years of age were eligible to be included for payment. Male bovines over 3 years of age may have been included for payment up to a maximum of 1 bull per 5 cows.

A bovine registered in the main section (in any class), or the supplementary section of the herd book was eligible for payment (REPS, 2007). The REPS has now been replaced by the GLAS scheme. For the rare breeds the same criteria are in place.

5.2 FAO

The Food and Agriculture Organisation (FAO) of the United Nations is committed to the conservation of plant and animal genetic resources. The FAO has a division which focuses on animal genetic resources. They have identified endangered species throughout the world and has put in place initiatives to preserve these vital resources.

According to the FAO effective management of farm animal genetic resources (FAnGR) requires comprehensive knowledge of the breeds 'characteristics, including data on population size and structure, geographical distribution, the production environment, and within- and between-breed genetic diversity. Integration of these different types of data will result in the most complete representation possible of biological diversity within and among breeds, and will thus facilitate effective management of FAnGR. These objectives are addressed under one of the four Strategic Priority Areas of the Global Plan of Action for Animal Genetic Resources adopted by 109 countries at the first International Technical Conference on Animal Genetic Resources, held in Interlaken, Switzerland in 2007, and endorsed by the FAO Conference (FAO 2007)

The Domestic Animal Diversity Information System (DAD-IS) has been developed by FAO to provide extensive searchable databases, tools, guidelines, references, links and contacts to aid the management of farm animal genetic resources. EFABIS has been developed from this system

Many organisations help to liaise with the FAO on various conservation projects such as RBI (Rare Breed International), EAAP (European federation of Animal Science), United Nations Environment Programme (UNEP), World Wildlife Fund for Nature (WWF) and the World Conservation Network (WCN)

5.3 The breeding societies

The Irish Moiled Society was formed in 1926. In 1982 the society received the support of the RBST to further encourage the revival and maintenance of the breed. The Irish moiled society has played a significant role in the prevention of extinction. At one stage in the 1970s there were only 2 small herds left. Through the society there were enthusiasts who continued to breed from the Irish moiled. Some of the cattle have been exported to the UK. This makes the breed less vulnerable as in the event of an outbreak of a disease there would be less of a chance of extinction. As of 2016 the Irish moiled society counts a total of 1552 Pedigree cattle in the country, 350 of which are located in the Republic of Ireland. There are 213 registered bulls, with 64 of these, in herds in the Republic of Ireland.

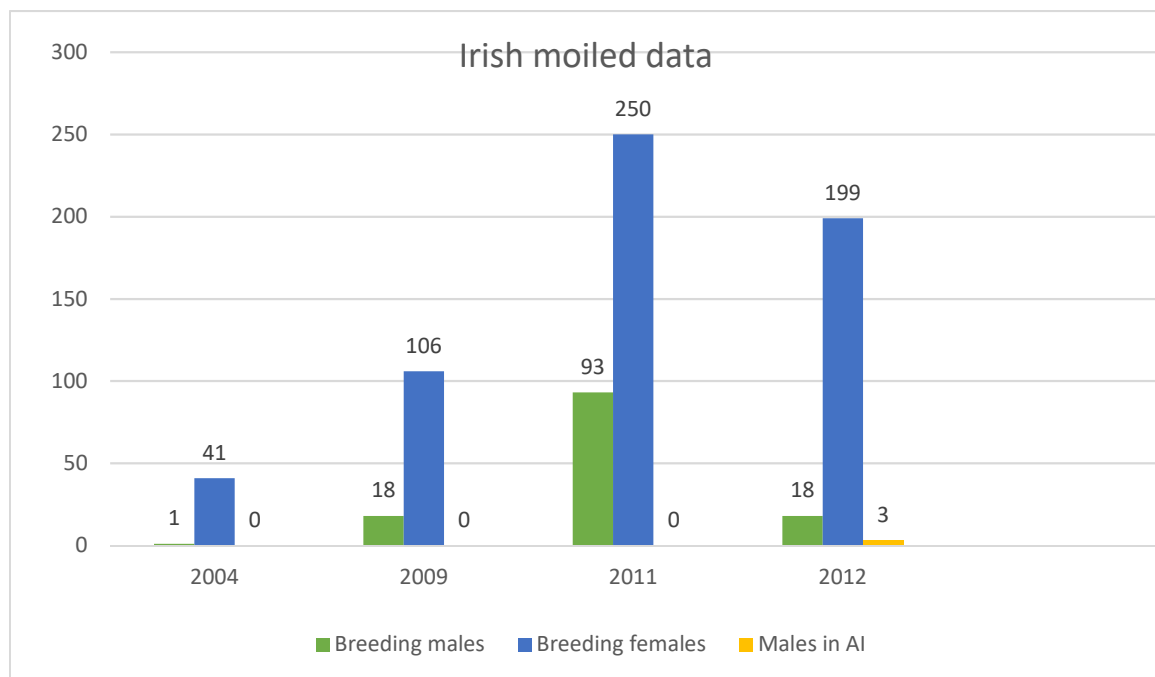


Figure 5 Moiled breeding data
Information from EFABIS

The Irish moiled cattle society has put in place a breed conservation strategy. This strategy aims to maintain representation of all the founder animals. Helps to identify the three rarest founder bloodlines and maintains these by a line breeding system.

Owners of Irish moiled cattle with the highest representation of the three founder bloodlines are asked to select from the Society's recommended bulls. The breeders should notify the Society before castration or disposal of offspring. Five lines are to be identified from the population which when bred in a cyclic manner will produce cattle with a low inbreeding

coefficient – i.e. below 6.25%. Breeders may, if they wish use the Geneped system to check the inbreeding coefficient of the progeny of any proposed mating. Maintain AI bulls by a line breeding system. Semen can currently be obtained from the RBST or Bova A.I (Artificial Insemination) in Co. Limerick. The use of conservation bank semen would be dependent upon agreement between the breeder and the RBST giving the RBST the option to collect semen from any male offspring. They maintain the diversity of AI bulls by adding those which produce offspring with a low inbreeding coefficient across a large proportion of the herd to the AI stocks. Push forward the breeding programme for the starred animals. A new grading up policy is deemed unnecessary unless the inbreeding coefficient can be seen to be unable to be controlled by the use of the Geneped analysis system. The Geneped system is an electronic Flock/Herd/Stud Book which gives you access to extended pedigrees, progeny lists and member details direct from the Breed Society to your own computer via online access. It is a good source for the society to monitor the gene pool. Fis is a measure of within population heterozygote deficiency. It is assessed using Wrights Fixation Indices (Wright, 1965). The employment of such theoretical mating programs is particularly beneficial to populations which have smaller sizes and are therefore potentially susceptible to inbreeding. Fis values range from -1 to 1 and negative values suggest a excess of heterozygotes while positive values suggest a deficit of heterozygotes. Populations which display an excess of heterozygotes have an outbreeding effect, while heterozygote deficiency indicates an inbreeding effect. All populations except the Kerry had an observed heterozygosity deficit. The highest inbreeding effects were found in the Dexter's $F_{is} = 0.049$. The Kerry's showed an observed heterozygosity excess $F_{is} = -0.002$ indicating slight outbreeding however overall mean Fis estimates for all populations showed no significant levels of inbreeding or outbreeding. No significant levels of inbreeding or outbreeding have been detected in any population examined so far. The Geneped system employed by the Irish Moiled Cattle Society, have been proven to be effective as the Irish Moiled populations displayed non-significant Fis values of -0.002 and 0.009. (Flynn, 2009).

The KCSI controls and monitors the breeding of Kerry cattle in Ireland. There are currently just over 100 breeders in Ireland. In 2014, there were 213 Kerry cattle registered and of this number 179 were females and 34 were males. A total of 364 Kerry cattle were birth notified to the Kerry Cattle Society. The society also promotes AI bulls. There are currently 11 bulls whose semen is available from various AI stations around Ireland.

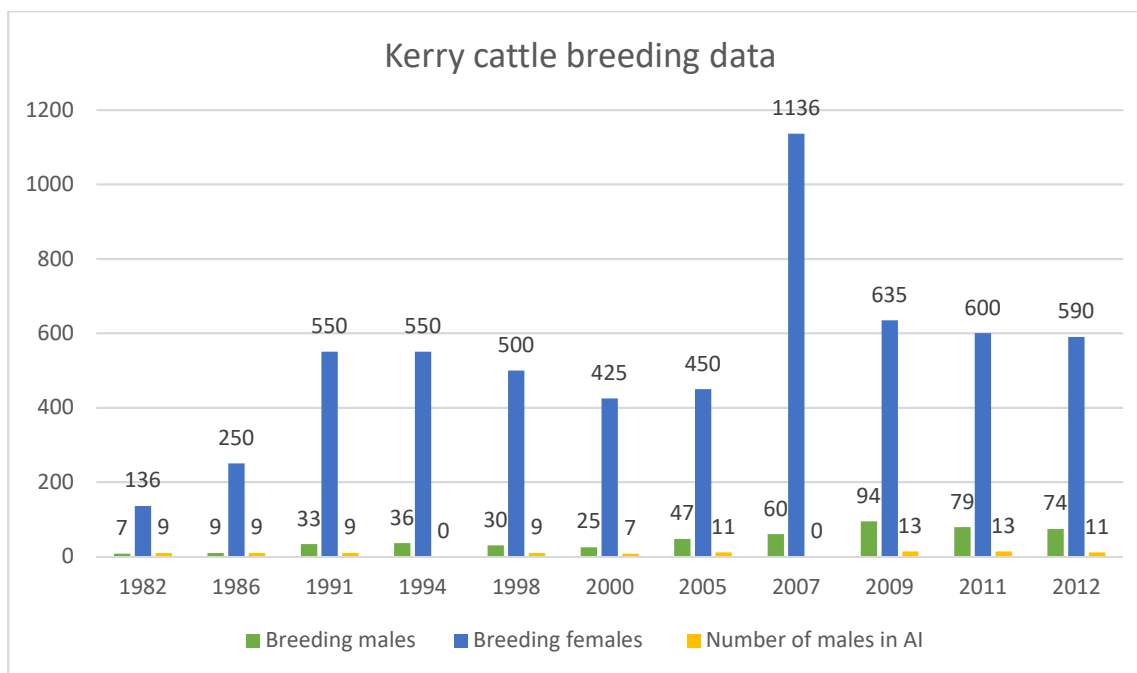


Figure 6 Kerry cattle breeding data
Information from EFABIS

All births male and female must be notified to the Kerry Cattle Society within 30 days of the birth, even if the calf is not being registered. Births should be notified on the birth notification form, available from the Society. All of the necessary details need to be given such as date of birth, ear tag number and sex of calf; dam's name, herd book number and ear tag number; sire's name, herd book number and ear tag number. If AI was used then the name of the bull, herd book number and AI code and date of insemination. The birth notification of all calves is essential if you applying for the Kerry Cattle Scheme. The Kerry Cattle Scheme rewards farmers with more than five registered breeding females with €76.12 per purebred calf subsequently registered with the herdbook.

There is no Irish Dexter cattle society group. It is currently being formed and they hope to establish it in the near future. At present there is a society in the UK which registers Irish Dexters. They use the Geneped analysis system also. This is quite important for this society as Dexter chondrodysplasia is considered to be inherited in an incompletely dominant manner with the homozygous form producing the congenital lethal condition. A preliminary minimum estimate of heterozygote frequency is 19% within the registered Australian Dexter herd, based on analysis of the contribution of three obligate heterozygotes whose semen has been widely used by artificial insemination in Australia (Harper et al., 1998). According to EFABIS in 2009 there were between 250 and 350 Dexter cattle in Ireland. Of these there were 145 breeding females.

The RBST monitors rare and native farm breeds. Every year the RBST collect data from breed societies and see the number of animals registered in a year to estimate the total number of breeding females. From these figures, the RBST are able to produce an annual up to date watch list. The RBST monitor any threats to breeds and other factors that can threaten breeds such as inbreeding and geographical concentration. The RBST preserve genetics in their gene bank. They collect samples from animals, usually semen from males but also embryos. If a breed were to become extinct, the RBST have the option of using this reserve to revive a breed. The RBST purchases genetically important stock and places it in approved breeding centres. The RBST encourage the breeding and registration of rare and native breeds. The RBST help to provide a network of knowledge to support and encourage breeders.

6. Discussion and conclusion

I have reviewed material on these breeds. I have observed the methods of conservations. The numbers of these rare breeds is steadily on the rise. This is good news for these breeds that were once very close to becoming extinct. The Irish moiled breed is being shown again at agricultural shows such as Tullamore and Balmoral which it was unable to do for many years. The genetic traits of these breeds which could be useful in the future have been preserved. The Irish moiled lack of horns is a great asset. The Kerry and the Dexter cattle have high butterfat content which is good for cheese and ice cream production. Farmers are beginning to see the benefits and are selling specifically Moilie and Dexter meat. Kerry and Dexter being used for ice cream and cheese production. These breeds have all adapted to the Irish climate and are hardy breeds that produce good calves. Through the efforts and awareness of the enthusiast breeders and the RBST these breeds are seeing a revival.

One of the problems with the revival of the Irish moiled breed is that a lot of the cattle have descended from a single line the Glenbrook line. Irish Moiled population showed similar low levels of genetic diversity on par with other rare breeds. The Irish Moiled displayed the lowest allelic richness levels which suggested that there is the possibility of a limited number of effective breeding animals within the population. No significant levels of inbreeding have been found among the Irish moiled, Kerry and Dexter cattle. (Flynn, 2009). The Irish Moiled breed does run the risk of becoming inbred but The Irish Moiled Society are doing their best through the Geneped system to reduce this. All of the societies want to preserve the breeds as healthily as possible. Through the Geneped system they have been able to maintain appropriate breeding.

Careful breeding needs to be maintained with the Dexters as chondrodysplasia is an inherited disorder. It causes large losses because of poor animal performance; structural unsoundness reduces the production and reproductive potential of the animal. If this inherited condition remains undetected in a population, then it will get propagated from generation to generation continuously which will increase the occurrence of the undesirable genes in the breeding population affecting negatively on per animal productivity. Most of genetic diseases are recessive and rare still they affects economics of animal breeders and farmers in long run. Provided that the current conservation schemes are maintained and the funding is given for the different projects. The EU has provided much support and funding to the societies in maintaining these breeds. There will be increases and decreases as it is only pedigrees that are

counted and not the crosses. The numbers of these native Irish breeds should continue to increase and hopefully in the near future they will no longer be rare breeds but flourishing breeds that are native to Ireland.

7. Summary

The aim of my thesis was to research the Irish moiled, Kerry and Dexter cattle which are rare native breeds to Ireland. I wanted to see if conservation methods of these breeds are successful in preventing them from becoming extinct. The decline of these breeds was so dramatic that by the late 1970s the Irish moiled breed had been reduced to less than 30 females maintained by two breeders in Northern Ireland and was nearly extinct. As of 2016, the Irish moiled breed is currently categorised on the at risk level of the RBST. There are currently 38 breeders in the Republic of Ireland with more in Northern Ireland and the United Kingdom.

By 1983 there were only 200 Kerry cattle in the world. The breed nearly became extinct. As of 2012 there is between 800 to 1000 Kerry cattle.

During the 1970s Dexter cattle were classified as an endangered and rare breed. It is estimated that there could now be 1000.

I looked at the assets of these breeds and some of the reasons for their decline. I examined the conservation methods that are currently being used. I found that through enthusiast breeders and the limited availability of semen through A.I that these breeds are making a recovery.

The RBST has a gene bank which should hopefully prevent the breeds from extinction in the event of a disaster or disease epidemic. The Societies and the FAO are recording the populations of these breeds and will put in place a plan if the conservation methods should begin to fail.

The department of agriculture has also put in place incentives for people to rear these rare breeds through their GLAS scheme. Preservation of these native breeds means that its genetic traits are being preserved. Even though these traits are not popular now they may be required in the future.

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9 .Annex

Breed	Number of registered breeding females in Ireland	Number of breeders in Ireland	Global Status of population
Aberdeen Angus	3500	>100	Not at risk
Aubrac	160	≥ 10 and ≤ 100	Not at risk
Ayrshire	500	≥ 10 and ≤ 100	Not at risk
Belgian Blue	500	>100	Not at risk
Blonde d'Aquitaine	350	≥ 10 and ≤ 100	Not at risk
Charolais	10000	>100	Not at risk
Dexter	28	<10	Endangered
Hereford	3600	>100	Not at risk
Holstein Friesian	150000	>100	Not at risk
Irish moiled	31	<10	Endangered
Jersey	1500	≥ 10 and ≤ 100	Not at risk
Kerry	360	<10	Endangered
Limousin	7000	>100	Not at risk
Meuse Rhine Yssel	1300	≥ 10 and ≤ 100	Not at risk
Montbeliarde	1700	≥ 10 and ≤ 100	Not at risk
Normande	120	≥ 10 and ≤ 100	Not at risk
Piemontese	120	≥ 10 and ≤ 100	Not at risk
Salers	400	≥ 10 and ≤ 100	Not at risk
Shorthorn	1500	≥ 10 and ≤ 100	Not at risk
Simmental	7000	>100	Not at risk

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11. Appendices

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