

GUERNSEY WORLD

THE OFFICIAL NEWSMAGAZINE OF THE WORLD GUERNSEY CATTLE FEDERATION

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12th World Guernsey Conference Tour Delegates

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John O. Mozier, D.V.M.

I am pleased to bring a favorable report of the success and health of your Association. In 2006 we had a profit for both the American Guernsey Association and Purebred Publishing. This past year we again had an increase in registrations of Guernsey cattle, building on the increase of the previous year. While there had been a decline of Guernsey numbers over the years from a peak of 114,000 registrations in 1952, (second only to Holsteins at that time) we are set to begin an ascent in numbers that the Guernsey cow and her breeders richly deserve. While there have been dairy cattle breeders who've made unfavorable comments about our breed, those individuals have obviously not been paying attention to the progress we have made. So we must, through active promotion, get the message to the dairy world that the Guernsey cow today is a far cry from the one they may have observed 20 or 25 years ago.

I have to be careful here as I don't want to stoke our Executive Secretary's ego too much, but Seth Johnson has done an outstanding job finding the right people for the right jobs, for both AGA and Purebred Publishing. And I commend him for maintaining an atmosphere in Reynoldsburg that encouraged Ida Albert, our very deserving 2007 Distinguished Service Award recipient, to stay on and mentor all the young people who been brought on board while continuing her positive attitude and friendly competent service for all of us.

Within the last few years, your Board established breeding goals for the Guernsey cow and those goals were reiterated this past week. Your Board had unanimously agreed that we should breed cows that are moderate in stature with dairy strength, with excellent feet and legs and with shallow udders that will last over numerous lactations. Our desire that the Guernsey cow should return to her roots as a high components cow has also been emphasized. With rare exception, Guernsey breeders have told me they agree that the moderate sized cow is healthier, reproductively more efficient and stays in the herd much longer than her oversized herd mates. Analysis of data regarding herd life confirms these observations. In addition, a Reproduction Committee has been formed for the purpose of finding ways to improve the reproductive performance of Guernsey cows, thus positively influencing productive herd life. I truly believe that if we Breeders all stay on the same track and stay focused on the right kind of Guernsey cow, we will see a resurgence of our breed.

During the past decade we have successfully defended and re-registered all of our Golden Guernsey trademarks allowing present and future breeders to be licensed to use these unique trademarks for products made wholly from Guernsey milk. I might add here that should we compromise our Golden Guernsey trademarks' registered description on file with the United States Patent and Trademark Office - that requires the products be made wholly from Guernsey milk - we would not only jeopardize the existing trademarks but would require that we re-register the marks with different requirements. This would be expensive with no guarantee the changes would be accepted and would likely make enforcement of the trade-



Topping the 2007 National Guernsey Convention Sale with the highest price in public auction for a Guernsey in recent history at \$23,600 was Dix Lee Tiller Joke, EX-90. Pictured l-r: Keith, Katie and Whitney Dixon, consignors; Jade Jensen, leadsperson; Bob Griggs, representing the buyer

marks impossible.

In closing, let me say that I have served in my community and in my profession in roles of leadership, but I have never served in any capacity that has been more rewarding or enjoyable than serving on AGA's Board and as your President. I have made so many wonderful friends in this Guernsey family and many of you are here today. I've also met some wonderful, gracious people in other parts of the world through my attendance at the World Guernsey Conferences, not the least of which is my very good friend, Bill Luff from the Island of Guernsey, who has been the guiding force behind the World Guernsey Cattle Federation and is with us this morning.

I don't want to be melodramatic, but I will say there are many things I enjoy in this life, and there are numerous things I like to do, but there are only a few things that I am really passionate about. First and foremost are my Faith and my love for my wife, Mary Lou, and my family. I am also passionate about my profession (if I hadn't been, I'd never have made it through Veterinary College) but ever since I received my first Guernsey calf from my Grandfather at age 10, I have been passionate about the Guernsey cow. There's no need for anyone to ask me why, for I can't explain it, but I do love Guernsey cattle. Mary Lou, though, would probably tell you that the priority of my passions sometimes gets out of order, and you, no doubt, know what she means.

Thank you again for allowing me to be a part of this great organization. I hope that in some small way my years on the Board have contributed to the progress and life of the breed. At least I have tried.

Full text will appear in The Guernsey Breeders Journal

The President's Address to Conference

by Ray Fiebiger

It gives me great pleasure to welcome all the delegates, speakers and guests to the 12th Conference of the World Guernsey Cattle Federation. It is very pleasing that we have so many breeders, and guest speakers both locally and from around the globe joining us over the next three days.

It is also a pleasure to have the international conference here again in Australia. As it was in Australia at the 5th Conference held in Canberra, 21 years ago in 1986, that the World Guernsey Cattle Federation was formed. So that gives us all a good reason to get together and celebrate, as we did last night.

Now over the next three days we will be able to consider how we have 'Come of Age'. This conference will present opportunities to look back and share our achievements, reflect on some challenges we have faced, as well as to look forward to what the future holds with new prospects.

I would like to begin by acknowledging those countries and breeders that were instrumental in the establishment of the Federation, with some of you here today. I would also like to recognise the work and effort of all those that have been actively involved and participated in the various programs over the years. When an organisation like this is formed it can quite easily be by name only with little activity, but the World Guernsey Cattle Federation shares a commitment to support countries and breeders in working together and to improve the breed.

A recent initiative is the Guernsey Global Breeding Plan. This was brought about through a recommendation by a panel of scientists and geneticists who were commissioned to look at how the Guernsey breed could speed up their genetic improvement. Many of you may recall that this Plan was accepted at our 2001 World Conference in South Africa.

With the exception of America who has the cow population to sample bulls at a satisfactory rate, I feel it is important that we all work together through the Global Breeding Plan, as I have seen cows in most countries that could contribute to the overall improvement to the breed. I urge all countries to consider their position and how they can be part of it.

If cow numbers in any country are not large enough to support traditional Bull Proving schemes then we have little alternative but to work together at an international level. We do not want to lose the best genetics from any country. It is important that we sample as many young sires as possible so we can keep the genetic improvements at the optimum level.

It is interesting to note that it was 21 years ago at the 1986 World Conference held in Australia where there was a presentation for the possibility of forming an international Bull Proving Scheme.

Also it was at the 1986 Conference that it was suggested that the way for the future of Guernsey milk was in speciality markets. At this conference we will hear again of the success of people in niche marketing, which may enthuse some of you to expand your business in this way.

Having visited South Africa, England, Guernsey and America in the past years and seeing first hand the success of

people who are processing their own milk into various products suggests to me that there is great potential for Guernsey people to value add to the raw product. Guernsey milk does have qualities that differ from other milk.

And it was some 40 years ago at the first World Guernsey Conference held in Canada, where the reproduction of the painting of the 'True Type' CQW by the American Guernsey Association was adopted as the type of Guernsey cow to be developed.

Once again we have the opportunity at this Conference to discuss what kind of cow is best for the future. We all have our own thoughts on this and I am looking forward to hearing your views on whether the Guernsey cow that was adopted 40 years ago, is still the ideal cow for the future. With ever changing methods of farming in all countries and much larger herds, we must make sure the Guernsey cow is a cow that will continue to fit into all systems.

One of the ever increasing problems for dairy cattle of all breeds is fertility. So this issue is on the agenda with an address on health and fertility followed by further discussions on the final day. As breeders, I suggest that we have all had difficulties in our herds to some degree. And one of the most common reasons given is - as we get higher production, fertility gets worse.

While this may be true to some extent, there are many aspects to fertility. I believe paying more attention to calving intervals on the dams and grand-dams of the bulls we select to use as AI sires, may be a first step that will help to improve the fertility of our cows.

I am also looking forward to the special meeting with delegates from each country to discuss the possibility of an international youth program. It was at the American Convention in Indiana last year where I had the chance to learn more about their Youth Program. I admire the work that is being done to develop the skills and capacity of young folk, and with our combined work there is a prospect that new opportunities will be provided for them. This type of investment into the future of our breed and dairy farming, and how we can go about mentoring each other and passing on our experiences, demonstrates the action that the Federation is prepared to take.

One achievement well known to us, is the publication of the Guernsey World. This is one way to satisfy our appetites for Guernsey news at an international level.

In closing, I had hoped to have the time to visit more member countries, however my family was presented with an opportunity to continue the expansion of our farming business, so this did not allow me much time to travel. It is a reality for all of us involved in dairying today, to keep a balance between commercial farming and breeding quality cows.

I would like to leave you with this quote that I consider to be particularly appropriate to us as Guernsey breeders as we are not a large breed in numbers:

"Never doubt that a small group of thoughtful, committed people can change the world. Indeed, it is the only thing that ever has."

The Australian Dairy Farming Scene

By Robert Poole, Deputy CEO and Policy Director of Australian Dairy Farmers

Twelve months ago ADF was concerned about the capacity of dairy businesses to compete for resources – land, water and labour.

This concern was being fueled by increased competition from Managed Investment Schemes, timber plantations, urban sprawl; lifestyle blocks, other forms of agriculture and other job opportunities.

Despite these factors, the 2006 Dairy Situation and Outlook (surveyed in March 2006) showed increased confidence amongst dairy farmers and you could almost feel the fact that milk flows and investment in dairy would have increased on the back of a third consecutive year of relatively high international dairy prices.

No-one anticipated the total failure of the spring of 2006 in the southern agricultural region and yet another dry season in northern Australia. The result is another body-blow to the Australian dairy industry with large losses incurred on many farms and a further billion or so litres and perhaps 200,000 cows taken from the industry.

Perhaps even more critical than these figures is the fact that the climate change debate has emerged as the single biggest issue of the day and every citizen in Australia has taken an interest in agriculture and our use of water and our emissions of greenhouse gases.

Urban and rural communities have been reconnected over the climate change and water debates. This is a time to work together as a community rather than apportioning blame.

Dairy farmers are like all other Australians – they read the papers and get concerned about what scientists predict and what this means for their families and their businesses.

The community, including dairy farmers deserves to be well-informed on environmental issues. All Australians must take the time to understand the issues more fully. For example drought, water management and climate change are connected to some degree but this relationship must be understood more clearly.

At present forecasters can only predict the weather accurately for the next five to seven days. So while farmers do not necessarily disbelieve the long-term climate predictions we do not have enough information to make decisions about our future farm systems. Farmers can best adapt when they have good science about an issue.

For example, about thirty years ago, researchers the community and farmers identified that salinity caused by high water tables threatened the sustainability of our natural resources e.g. salinity. Once the science of salinity related to irrigation practices was well understood the industry and community were able to work together to tackle the issue in our major irrigation areas. Now over 80% of dairy land is laser leveled for more precise water management. This improves water

use efficiency and reduces salinity and nutrient loss to our rivers and streams.

With the right information and technical solutions dairy farmers are more than capable of turning threats into opportunities and adapting to the world around them.

If climate variability is set to increase, then the scientific community needs to tell us more about this. We need research that demonstrates the possible and likely future of rainfall, irrigation allocations and pasture growth. To avoid debate on predicting future climates we might use a period of years that has already occurred and look at maximising profitability in these years through farms systems management including the management of risk.

For example the Wentworth Group has looked at the period of 1900 to 1950 when it was relatively dry compared to the 1950 to 1996. If we had this period of dry weather again, what farm systems could we have had in place to have farmed profitably?

If we have the same weather in the next ten years as we have had in the ten years just past – say from 1996 to 2006, what would we change in our farm systems to improve profitability? More annual pastures? More aggressive grain purchasing strategies? Different pasture species? Different breeds of cow? Alternate feeds? More silage and hay conservation?

Droughts of the past have changed farming systems as farmers have learned and adapted from those experiences. This is happening now but we do need the support of researchers, funded in part from our industry levies, to fill in some of the gaps and help us adapt to what nature throws at us.

The community needs to understand their choice on the environment

Milk and dairy products are unique in Australia. We effectively compete in the Australian and world market and demand remains strong. We have a proud history of producing safe food of the highest quality. Dairy is Australia's biggest food processing industry and employs 100,000 people – mainly in rural areas.

Dairy farmers understand the concerns of Australians who live in our cities and further understand that drinking water for our populations must be the highest priority. We seek the same understanding from the urban community when it comes to the people that rely on irrigation water to run their businesses and create jobs and export revenue.

The risk is that the current drought will be seen as the norm and water policy will change on this basis. Again good information will be key and cool-heads are required to ensure that water plans are long-term and provide security for all. The environmental outcomes must be clarified so that communities can make the inevitable choices between environmental, social and economic outcomes. The community needs to be clear that

the environmental debate is exactly that – a choice – and this must be clear and well-informed. If water allocations to farmers are significantly reduced then this will inevitably lead to less jobs, less exports and reduced economic activity especially in country towns.

Sending more water down a so-called “dying” river sounds simple enough but it comes at a big cost and community must understand this.

The pressure on Governments to address the so-called water crisis manifested itself at the Prime Minister’s National Plan for Water Security (NPWS). There are about 2,700 dairy farmers in the Murray Darling Basin (MDB) from the Darling Downs and Burnett regions in Queensland, down through the Tamworth, Forbes and Riverina districts of NSW, the northern Victorian dairy region and down into the river/lakes and Mount Lofty regions of South Australia.

ADF has been strongly involved in agriculture’s response to the PM’s plan via the NFF and meeting’s with Minister Turnbull’s department staff that have the job

ADF’s dairy irrigator group agreed that any transition to federal management of the MD Basin should respect the water sharing plans and allocation rules that have already been negotiated or are in the process of being negotiated. It was critical that irrigators had certainty of entitlements and allocation rules as farmers’ anxiety levels increased over climate change and policy reform.

ADF continues to work closely with NFF to seek assurances on water sharing plans and allocation rules as well requesting more detail on a range of other matters. ADF has been assured that key irrigator groups, including NFF and ADF will be fully engaged in ongoing development of the NPWS. We have dedicated significant resources to this issue and will continue to be involved as we await further development including the intentions of the Victorian Government.

The PM’s plan offers the opportunity to have a bipartisan agreement to the managing of the MDB. Exactly what irrigation in Australia looks like in ten years time will be driven by the outcomes of the PM’s plan and of course the weather and how climate variability affects future inflows and pasture growth from rainfall.

It should also be clear that farmers own and/or manage about 65% of Australia’s land and the challenge of environmental sustainability extends far beyond the banks of the Murray or Darling Rivers. Profitable farmers who have the capital to invest in projects that will increase profitability and sustainability are the key in the effective management of Australia’s land and water assets. This includes the management of all rivers and streams, biodiversity, soil health, reduction of pests and weeds and the appropriate recycling of wastes.

The farmer s I know are committed to sustainable farming. For example over 40% of dairy farmers are members of formal natural resource management (NRM) groups – probably the highest proportion of any sector of the community and the

great majority of dairy farmers are committed to sustainable farming as custodians of the land. Sometime the media give the impression that farmers are sitting around doing nothing about environmental management – this could not be further from the truth and is another example of how the drought and climate change debate become all-consuming.

We must ensure that the dairy industry has good access to NHT3 – the next round of Federal Government NRM funding – and that the issue of scope of the stewardship debate is well defined.

Emissions trading is another policy setting to have emerged strongly as a consequence to the climate change debate.

In a submission to the Prime Minister’s Taskforce on Emissions Trading. The ADF has expressed the view that a very cautious approach to emissions trading is appropriate. While it is unlikely (we hope) that emissions from agriculture will be directly included in any Australian emissions trading scheme, the impacts from a scheme will be strongly felt by agriculture. ADF’s main warning is about significant and unintended land use change that could be caused by emissions trading and the use of tree-based offsets by the energy sector. Like MIS, Governments need to be very aware of unintended outcomes from policy settings. This was the case with MIS and is also possible from wide-scale tree planting generated by emissions offset schemes. Like MIS this might be good for the farmer selling land for the offsets - but maybe not so good for neighbors, towns and industries that find themselves out competed by the energy sector being driven by emissions trading and offsets.

It should also be noted that trees are not a long-term solution to greenhouse gases. Trees stop growing, trees die and trees can burn down. It may be that more direct policy instruments are required – for example to directly support cleaner coal technology and find cleaner and cheaper forms of energy for the future. This is not just an environmental issue but a cost-based economic issue as well.

We will have emissions trading and agriculture needs to be heard in regards to how it impacts on international competitiveness and how tree-based offsets could impact on land-use and all that goes with it.

Levy Poll

The dairy industry in Australia is changing dramatically before our eyes. The ongoing drought in Northern Australia has seen milk production in Queensland and Northern NSW continue to fall. Some milk already moves massive distances between states to meet fresh product demand at certain times.

Major water reform will most likely not end - even if the PM’s plan provides some certainty around management – climate change and policy reviews will go on within the review periods of water sharing plans.

Energy use and emissions policies will have a profound affect on agriculture and have wide reaching and dramatic impacts on markets. Energy, agriculture and urban life will be

linked like never before.

Compared to 2001 the buying power of our levy and matching funds is now approximately 35% lower. This is a massive reduction in collective spend from dairy.

The ongoing challenges that dairy has faced has meant that even the very best dairy farmers are worried. They still love the industry but know that something has to change for us to compete in a rapidly changing world.

Having attended about seventeen levy poll meetings it was evident that the farmers needed a new vision for the future. Programs that bring the industry “up-to-speed” are no longer enough for many farmers.

Perhaps there is a new test to be applied to much of the work we collectively invest in – that is – if a reasonable number of farmers are already doing it - then invest in something else. Farmers want new options, new information, and new visions for productivity growth.

The last twenty years of the dairy industry’s successful run were driven by advances in breeding (ABV’s), pasture man-

agement and grain usage. These remain critical but traditional methods are no longer providing enough to overcome dry seasons and inflationary pressures.

We now look to the next phase, GM plants, automated milking, markers, new grains and market systems.

Plants, grains, labour productivity and cow genetics. These are the big four that will drive our future.

Today I have described a world ahead with unbelievable challenges for Australian agriculture and the dairy industry. No person in their right mind can say that they are not concerned about the future of Australian dairy farming.

Demand for dairy products remains strong and this is the good news. If we can support farmers with the information to help them develop farm systems that can adapt to climate variability and – if we can successfully argue for policy settings that give us reasonable access to resources, then we can get the Australian dairy industry back into a run of years with higher confidence to invest in a industry that can compete against all comers.

Workshop Reports

Understanding and Using New Breeding Technologies

facilitated by Robert Banks

The workshop agreed that new breeding technologies would:-

1. Assist early identification of cows and bulls for mating with more confidence and increase predicatibility of young sires and heifers.

2. Be most valuable in low heritability traits.

However excellent data sets are needed in order to use these technologies. High reliability data is required to identify the markers and will always be needed to keep progressing.

After discussion of the world programme incorporating the use of the new technology it was decided it could be more dangerous for inbreeding but that there are new programmes being developed to select sires and dams to avoid inbreeding.

Sexed semen could be used for matings if these technologies work to achieve young sires quicker.

The technology may give us the ability to broaden our genetic base by, for example, looking at cow families that are not so fancied.

Young sire programmes deliver tomorrow’s genetics today at yesterday’s prices. We need the WGCF to keep driving this technology research.

Niche Marketing

facilitated by Ross Hopper and Reuben Kotze

A Niche Marketing workshop was held with excellent participation from all countries in attendance. I know that we are the only workshop that can claim this as we had the lone South African amongst us. He is a shining example of what hard work can achieve in marketing Guernsey products. Not a single part of the Guernsey cow leaves the farm without adding value – milk and dairy products are sold in a store in the nearby town, as is “Guernsey Crap” fertilizer, Guernsey hides and Guernsey beef and sausage. Although Reuben Kotze cautioned that much of what he does is not permitted elsewhere in the world, he credits the Guernsey cow for allowing him to find a niche, value-added market.

These sentiments were echoed by Ross Hopper, manager of Maleny Dairies in Australia. The dairy processes all their own Guernsey milk as well as that of some area farms. They credit the Guernsey cow for giving them the niche that was needed to differentiate their product. They actively market the fact that the milk comes from Guernsey cow, which are different from the generics cattle producing other market milk. Both Kotze and Hopper stressed that marketing niche products takes much investment and hard work in establishing the actual process as well as working to develop a market for the products. Questioned directly by workshop participants, both said that they feel the Guernsey herself is the most important part of their marketing plan and that they would not be able to market as successfully without using the Guernsey cow.

“Breeding healthy cows”

facilitated by Jan Philipsson

The following questions were discussed by 15 conference delegates representing Australia, Canada, England, Guernsey Island, New Zealand and USA:

What are in priority the most important health traits, incl. reproductive traits, to improve for commercial production of the Guernsey breed in different countries? Sources for information may be culling/stayability statistics, disease statistics, economics, animal welfare, etc?

Response: In all countries fertility problems rate highest followed by mastitis among health problems in a broad sense to consider for improvement. It was emphasized that both management and genetic improvements are necessary for both short and long-term profitability of Guernsey cows.

Status of recording and genetic evaluation for prioritized health traits, or indicators of these, in different countries?

Response: For fertility traits all countries were reporting some kind of recording through the milk-recording system aiming at giving statistics on days open or calving interval. Genetic evaluations are conducted in Australia, New Zealand and USA, whereas they are expected to be in place later this year in both Canada and UK.

For mastitis resistance SCC is recorded and evaluated in all countries, and they also participate in Interbull evaluations. It was noted that also South Africa has genetic evaluation for SCC, but do not yet participate in Interbull evaluations. It was discussed whether any countries could improve their evaluations by including information on cases of clinical mastitis. Reports from both Australia and New Zealand indicated that their Farm Assurance systems require recording of all veterinary treatments incl. those for mastitis. More countries are working on the same line to assure traceability of their products. It was suggested that such information on clinical mastitis should be captured centrally and used for genetic evaluations as has been done in Scandinavia.

The group also discussed the needs to get stillbirth data from the various countries summarized to see whether there is a problem or not as regards calf mortality in the Guernsey breed. The breed is known for easy calvings, but as with Jersey, there might anyway be a large variation in stillbirth rate that should be investigated for its causes.

Status of publication of sire proofs for health traits?

- How familiar are you with the health proofs of bulls in your own country?

- How are domestic and Interbull proofs published in each country?

- How are you using these sources of information in your own operation?

Response: In all countries bull proof information on SCC is available to the breeders. Fertility information is available in countries where evaluations take place. In Australia international information is blended into the national proofs. Full use of all domestic and international information is used. It was uncertain how it was done in the other countries. Australia also publishes Interbull proofs for all traits on the Australian scale for all foreign bulls of each breed. It was uncertain how this was done in the other countries, so the participants were asked to find out how their systems for publication worked. They were asked to work for as much transparency as possible as Guernsey breeders need to know BV:s of all available bulls globally.

Weighting health traits into a Total Merit Index

- how is it done today in the different countries?

- what would be the desired weights of the different health traits relative to other traits in the TMI?

Response: It was concluded that various types of TMI:s were practiced in all countries. So far only little emphasis had been placed on health traits in these indexes. As countries have various measures directly and indirectly on health and fertility it was suggested that the weighting of various traits should be reviewed with the clear aim that the TMI practiced should lead to improved, or at least maintained fertility and mastitis resistance, along further improved productivity. Emphasis should be put on as direct measures of health traits as possible.

Do you produce a TMI for foreign proven and potentially active bulls in your country using Interbull proofs on your own country scale? If not, would you like to have it, and how would you get it done?

Response: Only Australia reported TMI:s for foreign bulls based on Interbull proofs to be continuously published for their farmers. It was suggested that participants of each country discuss within their organizations and with the responsible genetic evaluation unit how this could be best done in each country.

Implications of breeding for health in the design and execution of a “true” Global Guernsey Breeding Plan?

Response: It was concluded that although each country will have its own TMI, a Guernsey Merit Index should be developed taking into account the full use of the global Guernsey population and its need for a sustainable breeding program. It was suggested that fertility and mastitis should be given such weights that one could expect some improvement of these traits or at least that they can be maintained alongside the improvement for production.

SNP Project Update

The International Bovine Haplotype Map Consortium

by Curt Van Tassel (UDSA)

The bovine genome sequencing project was initiated in 2004. As part of that effort, a single nucleotide polymorphism (SNP) project was proposed to identify and validate 20,000 of these genetic markers. Breed associations around the world were invited to participate through funding the genotyping and facilitating DNA collection. A number of organizations committed to fund and endorse this effort. Several major artificial insemination companies also agreed to provide DNA via semen to support this research. In total, organizations around the world representing nearly 20 breeds committed support to this project. While the project has taken longer to complete than originally anticipated, the project goals have been met and substantially exceeded!

The data collection phase was recently completed, and comprehensive analyses have been initiated by the International Bovine Haplotype Map Consortium. The final data set includes genotypic information on nearly 500 animals representing 19 breeds. A total of over 35,000 SNP were characterized by the consortium.

Specifically, about 25,000 markers randomly distributed across the genome were selected for validation. In addition, 4,500 markers were identified through additional DNA sequencing of regions on chromosomes 6, 14, and 25. These targeted regions were chosen in an effort to characterize the effects of selection for traits of economic importance on the genome. Finally, 7,000 markers were identified through the sequencing of Brahman DNA to help understand genetic diversity among cattle.

Preliminary data indicated that the information content of these genetic markers, measured as minor allele frequency, will be useful for marker-phenotype association studies for the breeds evaluated. Approximate genetic distances among breeds are presented in Figure 1.

As we look forward, these data will be invaluable on a number of fronts. First, they will provide the first look at the structure of the bovine genome. Understanding the impact of selection and population dynamics will be essential for moving forward in genetic improvement programs. These data will also be useful for developing and refining sets of genetic markers that are useful for parentage verification and product and animal traceability. Finally, these markers will be considered

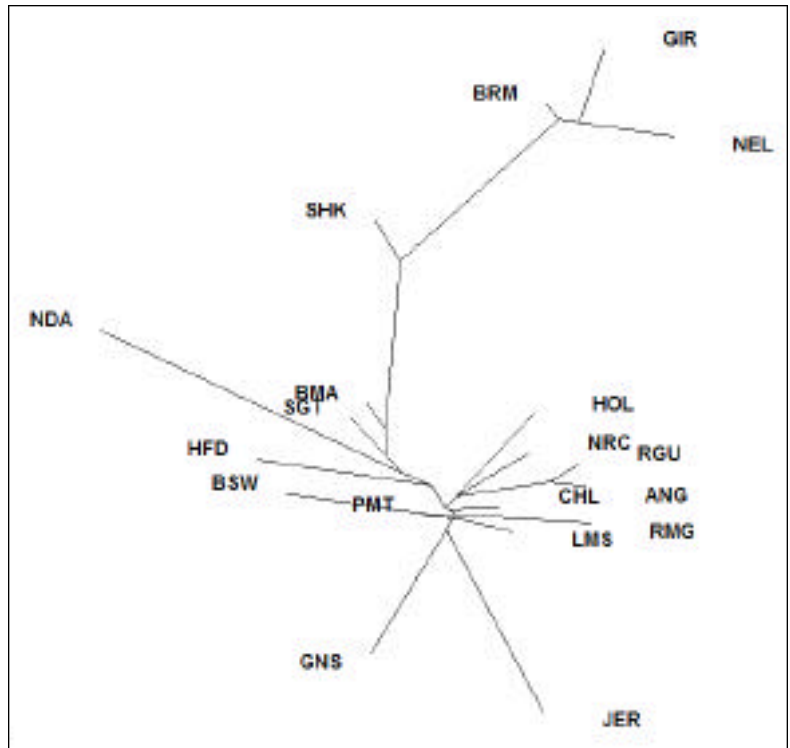


Figure 1.

Approximate breed distances for Angus (ANG), Beefmaster (BMA), Brahman (BRM), Brown Swiss (BSW), Charolais (CHL), Gir (GIR), Guernsey (GNS), Hereford (HFD), Holstein (HOL), Jersey (JER), Limousin (LMS), N'Dama (NDA), Nelore (NEL), Norwegian Red (NRC), Piedmontese (PMT), Red Angus (RGU), Romagnola (RMG), Santa Gertrudis (SGT), and Sheko (SHK).

in the development efforts to expand genotyping tools to a new level! As an example of that role, an independent consortium has recently completed the design of a 58,000 SNP assay platform. Data from this new assay will augment these data and provide an even deeper understanding of the structure, function and evolutionary history of the cattle genome. We expect these assays to have a profound impact through the enhanced prediction of genetic merit. The world of genetic improvement is poised to take a dramatic step forward, and it was through participation of organizations like the World Guernsey Cattle Federation that this all became possible.