WORLD SIMMENTAL FLECKVIEH FEDERATION

18th REGULAR MEMBERS MEETING

and

CONGRESS TECHNICAL PROGRAM

at

Rydges Melbourne Hotel

Melbourne, Victoria, Australia

Tuesday September 21, 2010

World Simmental Fleckvieh Federation

REGULAR MEMBERS MEETING and TECHNICAL PROGRAM

at Rydges Melbourne Hotel, Melbourne, Victoria, Australia
Tuesday September 21, 2010

Start Time	TOPIC	Speaker
8:30	WSFF President opens Members Meeting	Mr Bruce Holmquist
8:35	Australian President Welcomes WSFF delegates	Mr Tom Baker
8:45	Acceptance of Minutes	
8:50	Finance Report	Dr Georg Rohrmoser
8:55	President's Report	Mr Bruce Holmquist
9:00	Committee Chairmen Reports (5)	
9:25	Election of WSFF Executive	
9:30	Membership Changes, acceptance of new members	
9:35	Decision about next members meetings	
9:40	Presentation – 2011 WSFF Council Meeting Program ~ Italy	Italy Representative
9:55	Presentation – 2012 WSFF Congress Program ~ Germany	Dr Georg Rohrmoser
10:10	Presentations & Conferment of Honours	
10:20	General Business	
10:30	Chairman Closes Members Meeting	
10:35	Morning Tea	

CONGRESS TECHNICAL PROGRAM

11:00	Session Chairman opens Technical Program	Mr Bill Almond
11:05	Profile of the Australian Simmental	Mr Dale Baker
11:30	Integration of DNA technology in Performance Evaluation Systems	Dr Arthur Rickards
11:55	Servicing the cattle industry - Elders Livestock Management Solutions	Mr Chris Howie
12:20	**LUNCH**	
13:35	Role of Australian Simmental in crossbreeding for beef production.	Mr Peter Speers
14:00	Harmonisation of Type Classification in Europe	Mr Bernard Luntz
14:25	Genomic Selection in Europe	Mr Johann Tanzler
14:50	Session Chairman closes Technical Session	Mr Bill Almond
15:00	Afternoon Tea	

World Simmental Fleckvieh Federation
CONGRESS MEETING and
TECHNICAL PROGRAM

The World Simmental Fleckvieh Federation will conduct its Regular Members Meeting on the morning of September 21. This will be chaired by World President, Bruce Holmquist.

The Congress Technical Program will follow this meeting. It will feature addresses on a range of topics related to the Simmental breed, the Australian Simmental Association and future industry developments. Bill Almond, Chairman of the Congress Planning Committee will chair the Technical Program.

WSFF REGULAR MEMBERS MEETING

Chairman

Bruce Holmquist

President of the WSFF

Director of Programming and External Relations,
Canadian Simmental Association (CSA)

Past President of CSA.

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Tom Baker

President of Simmental Australia

and

Principal
Woonallee Simmental stud

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Dr Georg Rohrmoser

Director of ASR

(Association of South German cattle breeding and insemination organisations)

General Secretary of the European Simmental Federation (ESF)

Chairman of the WSFF Technical subcommittee and Chairman of the WSFF Budget and Membership subcommittee.

Haydnstr. 11,

80336 Munich
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Tel.: (49) 89 20 60 312-0
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Rinderzucht@t-online.de

website: www.asr-rind.de

Georg will give a presentation on the **2012 World Simmental Fleckvieh Congress in Germany.**

CONGRESS TECHNICAL PROGRAM

Chairman

Bill Almond

Chairman of the Congress Planning Committee and

Vice President of the WSFF

President, Simmental Australia (2005 – 2007)

A Foundation member of WSFF

One of the earliest breeders of Simmentals in Australia and principal of Kensileyre Simmental stud.

PO Box 1020,
Wagga Wagga, NSW, 2650 **Australia**.

Phone: (+61-2-6928-4215)

Email: bill.almond@bigpond.com

SPEAKERS

Dale Baker

President, Simmental Australia (1983 – 84)
Life Member, Simmental Australia
Member of Parliament, SA (1985 – 97)
- Opposition Leader and Minister of various portfolios.

Businessman

PMB 52
Millicent SA 5280
Australia

Dale Baker, as a senior and founding member of the Association, will present an address titled

"Profile of the Australian Simmental"

This will trace the historical development of the breed in Australia over the past 38 years.

Dale Baker and his brother Dean founded the Woonallee Simmental stud which bred the first Simmental calf born in Australia.

He was heavily involved with the formation of the Australian Simmental Breeders Association and its South Australian Branch, on which he served for many years.

He was President of the Australian Simmental Breeders Association for two years (1983 - 1984) and during the 1984 World Simmental Congress in Australia.

He has been a primary producer and businessman with interests in South East of South Australia, interstate and overseas.

These have included grazing and vineyard properties in South East of South Australia. He is a Director of the Banksia Company, producer of native flowers for Australia and export overseas.

He is also a Director of Padthaway Estate, champagne and wine producer at Padthaway in South East of SA, distributing in Australia and overseas.

Dale was the Member for the seat of MacKillop in the South Australian parliament from 1985 – 1997. During this period he was Leader of the Opposition (1990 – 1992) and Shadow Minister for Ethnic Affairs, Shadow Minister for Primary Industries, Forest and Fisheries.

He was Minister for Primary Industry, Minister for Mines and Minister for Finance during the period 1993 – 1997.

He has been actively involved with other organizations. He was Director of State Swim Victoria P/L, developing educational swimming centres in Melbourne.

His strong passion for the Limestone Coast led to his appointment as Chairman of the Regional Development Board for the area.

He was a member of the governing council of United Farmers & Stockowners of SA, a former Chairman of the Millicent Hospital Board and member of the Port Adelaide and Port Power Football Clubs.

Dale was honoured with Life Membership of the Australian Simmental Breeders Association and was Recipient of the Australian Centenary Medal in 2003.

Chris Howie

National Livestock & Wool Manager
Elders Solutions

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Adelaide, SA, 5000
Australia
Phone: (61) 8 8425 4724
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Chris will present an address outlining the range and beneficial value of the Elders Livestock Management Solutions services offered by this leading rural business.

The address will be titled:

"Servicing the cattle industry - Elders Livestock Management Solutions"

Chris Howie joined Elders in 1988 in South Australia where he worked across all aspects of the Stock and Station agency business, with a focus in Sheep and Wool.

He moved to Inverell, NSW in 2000 where he became heavily involved in the cattle side of the business and grew his knowledge of beef from there.

In 2005 he moved back to South Australia when he took a role at Mount Gambier. At the time this area was heavily focussed around the milk vealer trade which had solid influences from the Simmental breed in particular. Chris spent much of his time working with milk vealer producers and driving this aspect of the business.

In 2008 Chris became the State Livestock Manager for SA/NT where he was based in Adelaide overlooking the livestock product for these two regions.

In 2009 he became the National Livestock and Wool Manager for Elders, where he oversees the Elders Livestock and Wool business in Australia.

Dr Arthur Rickards OAM

Managing Director
Agricultural Business Research Institute

University of New England
ARMIDALE NSW Australia 2351

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Fax: +61 2 67 72 5376
Email: office@abri.une.edu.au

Dr Rickards will present an address titled:

"International trends in beef cattle performance recording and genetic evaluation"

Dr Rickards has worked at a high level in the livestock industries internationally for 45 years, involving:

- Setting up the Agricultural and Business Research Institute (ABRI) in 1970.
- Managing Director of ABRI since 1970.
- Manager, National Beef Recording Scheme since 1972.
- Executive Director, Australian Registered Cattle Breeders Association since 1979
- Director, International Livestock Resources and Information Centre since 2001.

Dr Rickards has 37 years of experience in national livestock recording systems. He is largely responsible for the marketing of ABRI's livestock recording systems into 20 countries.

In 1996 he was awarded the Medal of the Order of Australia (OAM) for outstanding services in the livestock industries. In the same year the Rural Press Group rated Dr Rickards in Australia's top ten 'movers and shakers' in agribusiness.

He is an Honorary Life Member of the National Livestock Pedigree Council of the USA.

Peter Speers

Former CEO, Simmental Australia (1987 – 2007)

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Bensville, NSW Australia 2251

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Peter Speers will present an address titled:

"Role of Australian Simmental in crossbreeding for beef production"

Peter was Chief Executive Officer of Simmental Australia (1987 – 2007)

Prior to that he was Principal Livestock Officer (Beef) with NSW Agriculture.

During his time with Simmental Australia he also represented the Association as:

- Director, ABRI Board of Directors (1993-2007)
- Chairman, Southern Beef Technology Services Committee (2006-2007)
- Vice President, World Simmental Fleckvieh Federation (2002-2006)
- Chairman of WSFF Beef Production Sub Committee
- Executive Member, Australian Registered Cattle Breeders Association
- Member, Breedplan Technical Advisory Group and the NSW Beef Committee

He was awarded WSFF Honorary Life Membership and the WSFF Golden Book Award

He was also awarded Life Membership of Simmental Australia.

Bernhard Luntz

Bavarian State Research Center for animal breeding

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85586 Poing-Grub
GERMANY
bernhard.luntz@lfl.bayern.de

Bernhard studied agriculture at the university of Munich – Weihenstephan from 1979 – 1983.

In 2004 he was employed at the governmental research center for animal breeding in Bavaria.

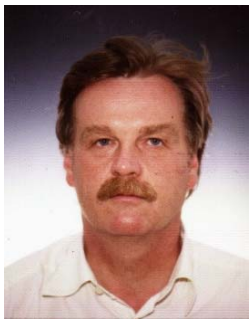
He was responsible for the conformation of bull daughters and coordination of the breeding program.

The task is done by government and is independent and neutral.

He is a member of the European task force for conformation traits.

Bavaria is a typical Fleckvieh – Simmental country with approximately 80 % of the total beef population.

The breeding population is about 750,000 cows and the number of testing bulls is 480 each year.



Johann Tanzler

Manager,
Fleckvieh-Austria

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Johann studied agriculture at Franzisco-Josephinum in Wieselburg.

He was then engaged as Farm Officer for cattle breeding, feeding and management for the Lower Austrian breeders organisation (about 4000 breeders).

Later he became Manager in the same organisation, responsible for science projects, development of the systems, build up und leading the “linear scoring system” in Austria.

In 2005 he was appointed to lead the EVF work group “conformation traits” and was responsible for developing the “Rinderdatenverbund = RDV” for Austria and Germany.

In January 2008 he was appointed Manager of Fleckvieh-Austria, including the agendas to coordinate the breeding program, develop the Fleckvieh Breed, international contacts and cooperation.

Fleckvieh-Austria (AGÖF) is the Austrian Association, coordinating 11 breeding organisations with 15,000 breeder members. Austria is the country with the highest percentage of Simmental-Fleckvieh: more than 71% of the herdbook cows and nearly near 80 % of all cattle. The Austrian breeding population includes 270,000 herdbook cows, the number of testing bulls is 150 per year.

The Simmental History in Australia

Dale Baker

Foundation Member, Past President and Life Member
The Australian Simmental Breeders Association

The Scottish Beginning

The Scottish Milk Marketing Board together with a group of prominent Scottish stud cattle breeders having seen the financial success of the introduction of the Charolais breed into the United Kingdom and then into New Zealand and Australia in the mid sixties decided to select from Germany 200 pedigree Simmental heifers and 6 bulls to import to Scotland and subsequently to export semen to Australia and the progeny of the heifers that came to Scotland to New Zealand. Only the progeny of those heifers born in New Zealand were allowed to be exported to Australia due to our very strict quarantine laws. These cattle arrived in Scotland in 1969.

The selection panel of stud breeders that went to Germany to make the selection were Jim Biggar, Willie Young [his son John is judging at the Royal Melbourne Show during this World Conference] and Frank Young whose son Jim was a prominent breeder in Australia and inaugural council member of the Australian Simmental Breeders Association. The Scottish Milk Marketing Board representatives were Archie Campbell and Jim Swanney, both became very well known to Australian cattle breeders.

The bulls imported which were to become the foundation sires of the Australian breed were Scottish Herod, Hope, Pride, Neff, Neptune and Marquis. The first semen arrived in Australia in 1972 and the first calf with Simmental blood, a half bred bull, was born on 10/1/73. The first pure bred Simmental animal was a bull calf imported from New Zealand and arriving in Australia in October 1973

Some semen also came in from bulls imported to England by the English Milk Marketing Board and these included M.M.B. Langle, Schock, Seegar, Cambridge Rhuma and Hampshire Mayer. Bulls were also imported into Ireland for this export market.

The Push from Australia - The Formation of A.S.B.A.

At about the same time as purebred bulls and heifers were being introduced into the United Kingdom there was considerable interest from businessmen, entrepreneurs, stud and commercial cattlemen from all around Australia to be part of the introduction of the Simmental breed into Australia. Unfortunately two groups went their own ways in the formation of a breed society to be the controlling body in Australia and be the custodian of the stud register.

Group 1 The Australian Simmental Breeders Association Limited was formed at a meeting held on 31/3/1971 and was chaired by G.F.M. Quinn

Group 2 The Association of Simmental Cattle Breeders was formed under the auspices of the Royal Agricultural Society of New South Wales at a meeting held in the Cole - Dudgeon hall on 1/4/1971. L. A. Pockley was elected chairman at that meeting.

Many subsequent meetings and negotiations were held to try and bring the two groups together. According to Council minutes, the credit in helping to achieve this was the visit of the representative of the German company Spermex Dr. Uwe Riest who visited most Australian states on a lecture tour on the benefits of the Simmental breed. His strong belief was that only a united group could enhance the breed's introduction into Australia. Spermex donated funds for a trophy for Simmental cattle in the Society's early years.

Further discussions were held and finally it was agreed to merge. Elections were held in all states to elect their representatives to serve on the council of the new body which ultimately became the

Australian Simmental Breeders Association. This meeting was held at the Sydney Showgrounds on 29 March1972. The councillors elected by members in each state to be the first national council were:

New South Wales	D.S. Bain, C.R.G. Bowman, P.J. Magennis, G.F.M. Quinn
Victoria	W.R. Beggs, H.W.W. Hopkins, T.J. Liley. McLaughlin
South Australia	D.S. Baker, J.W. Young
Queensland	E. Ryland, J. Witherspoon
Western Australia	A.S. Fletcher, R.W. Vincent.
Subsequently	J.A. Dumaresq was elected from Tasmania

Some of these original councillors are attending this world conference.

Early Registrations and the Breeding Up Process

The first big decision the new council had to make after its election was to determine under what criteria Australian pure bred Simmental cattle could be bred.

There was much diverse opinion and debate as to what would constitute a base dam. The stud breeders' lobby was anxious to only allow registered females of a breed society to be used. This was opposed by those who wished for as wide a gene pool as possible to be used in the breeding up to purebred of the ultimate Australian purebred Simmental. This recognised the wide climatic and genetic variance of the Australian cattle industry and the contribution made by commercial cattle breeders.

It was finally decided that any breed or crosses thereof could be used as a base dam but its details had to appear on the registration form of the F1 progeny. In hindsight it was a very wise decision

It was further decided that four top crosses would then constitute an Australian pure bred animal, that is only the progeny of F3 females will be admitted to the pure bred register

Registrations of Simmental blood cattle from 1972 till 1990 contained large numbers of these F1, F2 and F3 animals that were being used to breed up to the Australian purebred Simmental.

To the end of 1990 during the breeding up process a total of 173,753 animals had been registered but this only included 36,536 pure females and 28,516 pure bred bulls.

In the next twenty years 60,881 females were registered and 46,532 bulls. Almost entirely pure bred.

Total registrations on the Simmental register are to date 281,166

Show and Sales

From the earliest days of the breed's introduction into Australia we were very fortunate to have as members some very high profile people from the corporate and political world who understood the value of promoting the breed. This was supported by the A.S.B.A. Council with generous allocations of funds to the promotions committee.

We were also fortunate to have the support of well respected stud breeders from other breeds that were prepared to assist the new Simmental breed by becoming judges at Royal and provincial shows, offering frank and constructive criticism in judging the cattle presented to them. This, although criticised at times, assisted the breed to develop an Australian Simmental that would be in demand by commercial cattle breeders.

The first sale to offer pure bred and F1 cattle in Australia was at the Mount Gambier South Australia race course on February 1974, this was followed by the first Simmental Royale held at Glen Parc Mittagong in April 1974 when the world record price for a pure bred Simmental heifer of $43,000 was paid and $25,000 was paid for a pure bred bull.

Sales followed in many high profile venues as breeders pushed to promote the breed. One of the great spectacles was the Simmental sale held in the Grand Ballroom at the Hotel Regent, Sydney at the World Conference in 1984.

The Cattle Leasing Phenomenon

The Society was faced with a complex decision post 1975 with the new tax driven product of cattle leasing. This meant that people or companies that wished to use the tax advantages of the tax law as it stood could become members and use a breed society's register to register cattle they had purchased and then leased to corporate or individual entities for a high up front lease fee, all of which was tax deductible. These cattle would then go into an ovum transplant programme to rapidly breed up and get the progeny onto the market to obtain a return.

The Society agonised over what controls could be put on this legitimate, at the time, practice to protect the society's register and the quality of the cattle that would be thrown onto the market by non experienced cattle breeders whose main objective was to obtain tax deductions for all cost associated with the leasing arrangement in the year of commencement of the lease.

The Society decided to not only increase inspections on cattle sales but to dramatically increase registration and transfer fees for these animals. At a critical time in the breed society's growth we believed protecting the society's register and the quality of cattle put on the market was paramount.

The money collected from these fees was used for two ways to assist the breed's future.

Firstly we greatly increased the budget of the Promotions Committee to further promote the breed and secondly we purchased freehold property on the Queensland coast as an investment for the society's future. This warehouse gave the society a good return over many years. We were indebted to the new CEO at the time, Ian Bonifant for his help and experience in all these matters.

The Alliance with ABRI

As I wanted this alliance because of its historical significance to both parties to be accurate I asked
Dr. Arthur Rickards who is also giving a paper today to assist. This is what he wrote.

"The agricultural business research institute (ABRI) was formed on July 1, 1970 to provide agribusiness information services to the rural sector. Its major project came in August, 1972 when it was appointed to run Australia's newly-established national beef recording scheme (NBRS).

At about the same time Dick Vincent and Alan Fletcher visited Arthur Rickards and asked if ABRI could set up a computerised breed register for Simmental that included pedigree and performance data. This was done in 1973 and it was the first integrated pedigree/performance system offered in the Australian beef industry. In retrospect it was very primitive but it got the job done.

In 1974 the Australian beef industry went into a deep depression as oil price spiked and Japan ceased to buy Australian beef. Simmental set an example to the rest of the beef industry by maintaining its strong commitment to performance recording through such a challenging period.

The breed attracted strong interest through its ability to improve productivity of traditional breeds in traits such as growth and maternal ability and at one time held no. 3 spot for registrations. Today a Simmental infusion is widespread in Australia's commercial cattle industry.

In the early 1980's a young German geneticist called Dr Hans Graser joined the staff of the animal genetics and breeding unit (AGBU) which undertakes the genetic research behind the products that ABRI offers. Dr Graser, now director of AGBU, pioneered the development of Breedplan with Dr Bruce tier. Simmental was one of the first breeds to use the sire summary service of Breedplan.

The combination of ABRI's breed register expertise and the Breedplan genetic evaluation service broke into international markets in the 1990's and now around 140 breed societies across 15

countries use the system including Simmental breeders in Australia, New Zealand, South Africa, Namibia and the up.

For many years Simmental Australia maintained an office in Sydney while ABRI undertook the society's data processing and genetic evaluation work in Armidale. At the start of 2008, Simmental Australia moved its office to Armidale and Damian Coffey was appointed as part-time Executive Officer. Technical support for Breedplan is provided via Southern Beef Technology Services (SBTS) – which is syndicated across 15 breeds to achieve economies of scale. This project was the brain child of Simmental Australia's previous Chief Executive Officer, Mr. Peter Speers.

In 40 years ABRI's team has grown from three people to around 190. However, Simmental Australia was ABRI's first corporate client just as ABRI was the first corporate service provider engaged by Simmental Australia. This contributes to a somewhat unique bond between the two organisations."

Dr. Rickards is not only a client of A.S.B.A. but a long time friend to many breeders throughout Australia

World Congress Involvement

The Australian Simmental Breeders Association has been proud to host two World Congress events.
The first one in 1984 which was held in Sydney and this 2010 Congress being held in Melbourne.

Since the formation of the breed in Australia each overseas world conference has been attended by Australian breeders in their thirst for knowledge on the world trends of the breed. This interest and its recognition by the World body has allowed Australian Simmental breeders to showcase to the world the progress we are making in the Australian Simmental on two occasions.

The organizing committee for the World Congress in Sydney in1984 was chaired by Paul Trenoweth and included Wendy Miller, James Loneragan, Alan Fletcher and Dr. Ian Marshall. The extravaganza not only included the largest showing of pure bred Simmentals at a Royal Show but the blocking off of George Street at Sydney peak hour traffic to parade 27 sale cattle from Circular Quay to the sale venue in the Grand Ballroom at the Hotel Regent. The chairman of the sale committee was James Loneragan.

This World Conference in Melbourne is another chance for the breed to showcase its progress and the organizing committee is chaired by Bill Almond and includes Tom Baker, Gary Gillet and Mel Ryan.
We hope this congress also highlights our contribution to the world breed we are now part of.

The Breed's Progress So Far

The Simmental breed has adapted over the years to the ever changing environment. The breed has changed for a number of reasons, one is climatic conditions and the other is adapting to the ever changing Australian market. The traditional Simmental has become a more flexible animal that can be used either for its maternal traits or strong carcass attributes. The moderation in frame size and increased fat coverage has brought the traditional Simmental back into the market both in the Northern and Southern regions.

The Society has opened up four additional registers to cater for the needs of stud breeders to provide quality registered animals for crossbreeding programmes.

The development of the Black and Red Simmental stud registers has opened many different markets for the Simmental breed. The solid colour pattern and the polled factor has seen these cattle become available to the huge crossbreeding market and the Angus market. Their strong carcass attributes have seen them develop rapidly across Australia.

The Simbrah stud register allows the Simbrah to be the ultimate cross for the Northern markets with the tremendous blend of the toughness of the Bos Indicus and the carcass quality of the Simmental growing the Simbrah into a powerful force in northern New South Wales and

Queensland. The Simbrah has taken all before it in carcass competitions in the North with dominance in the recent Beef 2009 carcass competition in Rockhampton.

Crossbreeding Simmental with Angus or Red Angus has proven very popular. Recognising this demand, the Simmental Society developed a performance register called "SimAngus" - providing registration and Breedplan recording of eligible cattle with varying degrees of Simmental and Angus (or Red Angus) content. SimAngus is the convenient way to capture hybrid vigour and value. This crossbreeding system has the ideal balance of maternal and carcass traits.

The Future Role of the Simmental Breed

Playing host to the 2010 World Simmental Congress has presented us the opportunity to reflect on the origins of this global breed and the influences it has had on the cattle industry throughout various parts of the world. This highlights the breeds great ability to adapt to the vast array of climatic and production differences.

The ongoing theme of the Congress is "Designing a Profitable Future" and by doing so a focus must be given to the future role of the Simmental breed and the significant contributions it is able to make to the Australian cattle industry. Furthermore, by formulating the future role of the Simmental breed it paves the way in identifying the key growth areas for the breed and what needs to be done to achieve a greater representation in the composition of the Australian cattle herd.

Simmentals have, in more recent times, shown encouraging signs of a swing back to favour. The Northern tropic and Southern temperate herds look to Simmental to assist in improving fertility and maternal attributes, longevity and ability to adapt to alternative conditions. Couple this with superior weight-for-age, improved muscling, carcase quality and yield it has the potential to add value to any commercial operation.

The alternative Red and Black Simmental hold a significant advantage in a commercial market where coat colour is of importance. We have seen the Angus herd grow to become what is now a prominent fixture in the Australian temperate herd. Commercial producers of predominantly British breeds are aware of the huge benefits presented in breeding composites of British and European animals. Breeders of Black and Red Simmental recognise that a consistent coat colour was considered by some as an important trait which was originally dictated through our ties with the Japanese and Korean markets and in more recent times the domestic branded market.

Commercial breeders are recognising the improvements and genetic gains made by Simmentals in calving ease contributed by a decrease in average gestation lengths and high levels of continuous recording of birthweights and calving difficulty scores without having any impediments on the favourable traits Simmentals are renowned for.

In order to continue to grow market share and sustain a profitable future for the breed, we must take a more proactive response to assessing responsibilities as seedstock producers. It is essential that genetic improvements made by the breed are able to be measured and benchmarked. As a breed we cannot communicate and promote these improvements without improving the recording of this information.

Only then can we show commercial breeders and bull buyers that we recognise their desires and requirements and that, as stud breeders, we are doing everything possible to produce animals that meet their needs.

In most recent times there has been a rush in developing genomics technologies that, when used effectively, can assist in making more informed breeding decisions and increase the rate of genetic improvement.
In order to track genetic improvement we must set achievable objectives and observe influential traits by employing all viable means available.

It is every breeder's responsibility to strive to improve their product with each generation. More importantly it is essential this improvement is amplified in clients' herds and adds value to all facets of the supply chain.

The Simmental breed in Australia has made significant progress in developing high performing animals and producing a top quality product however, the supply chain starts with the seedstock and stud breeders hold the greatest ability to add value and make improvements to the quality and consistency of the end product.

The Australian Simmental Breeders Association, through our alliance with Rural Press, has increased our marketing activity by implementing a National marketing program. This has assisted Simmental to dominate headlines in all states. With members, state and federal bodies working together towards a common goal it has seen further unity and confidence in the breed. It is up to the individual members to work together, focusing on a common goal, creating the positive stories and proactive perception of the breed. With the breed working together it will assure Simmentals place in the Australian herd for generations to come.

The Simmental breed is unique, and with so many options mentioned above our breed has an amazing future in the beef industry throughout Australia. The formation of four additional stud registers also recognizes this demand for quality animals for crossbreeding programmes.

SIMMENTAL HISTORY ~ PRESIDENTS, CEOs and LIFE MEMBERS

A.S.B.A. PRESIDENTS

R.W VINCENT	1972 -74, 1976 - 78
D.G. McTAGGART	1979 - 81
A.S. FLETCHER	1982
D.S. BAKER	1983 - 84
D.McK EMERSON	1985 - 87, 1990 - 91
K.R. LOWE	1988 - 89
M.J. DUMARESQ	1992 - 94
J.F. LONERAGAN	1995 - 96
R.D. BAKER	1997 - 99
C.A.S. COWCHER	2000 - 02
G.W. JORDAN	2003 - 04
E.W. ALMOND	2005 - 07
T.R.S. BAKER	2008 -

A.S.B.A. CEOs

D. THOMAS	1972 – 74
M. KEATS	1975
I. BONIFANT	1976 – 83
R. SIMPSON	1984
J. DAVISON	1985 – 86
P. SPEERS	1987 – 2007
D. COFFEY	2008 -

LIFE MEMBERS

DR. H. GRASER
R.W. VINCENT
D. McK. EMERSON
C.A.S. COWCHER
P. SPEERS
H.W.W. HOPKINS
D.S. BAKER

INTERNATIONAL TRENDS IN BEEF CATTLE PERFORMANCE RECORDING AND GENETIC EVALUATION

Presented by:
Dr P.A. Rickards OAM
Managing Director
Agricultural Business Research Institute
University of New England
Armidale NSW 2351 AUSTRALIA

1. Introduction

I had the privilege of attending the first World Simmental Congress in Zagreb in 1974 as a guest of the late Dr. Heino Messerschmidt of Germany's ADT. At the time Australia had only a handful of Simmentals. Having now served my apprenticeship, it is even a greater privilege to be invited to speak at this 2010 World Simmental Congress and I thank the organisers for their kind consideration.

My paper will discuss:

- How performance recording has developed to cover a balance of production traits;
- How modern performance programs balance individual traits to obtain a selection index or indexes;
- How selection indexes form the basis for genetic tools that can be used to maximise genetic progress in economic terms;
- How gene marker information is being used to improve estimated breeding values;
- Software for minimising the effects of genetic defects;
- Progress with across-country evaluations;
- Internet Information Services;
- Opportunities for Simmental;
- The challenge – how better performance recording systems can make Simmental more competitive internationally.

2. Traits Recorded

Initially beef cattle performance recording systems focussed mainly on weight gain. The rationale was simple:

- Farmers can easily record weight.
- Weight gain is moderately heritable, and
- Many cattle are sold by weight so heavier cattle make more money.

However, long term selection based mainly on weight gain can be detrimental to some other production traits such as calving ease.
Modern performance recording programs cover a wide range of production traits. For example, Table 2.1 shows the traits that are evaluated in the BREEDPLAN® genetic evaluation system that is used by the Simmental breed across five countries – Australia, New Zealand, South Africa, Namibia and the United Kingdom.

Table 2.1: Traits Evaluated in BREEDPLAN®

Growth	Fertility	Carcase	Other
Birth	Scrotal size	Carcase Weight	Docility
Weaning	Days to Calving	Eye Muscle Area	Feed Intake
Yearling	Gestation Length	Rib Fat Depth	Flight time
Final	Calving Ease	Rump Fat Depth	Shear force
Mature Cow		Intramuscular Fat %	Conformation
Maternal Growth		Meat Yield %	

Standard Traits Specific Traits

All master breeders know that the commercial industry needs a balance of growth, fertility, carcase, docility and conformation and so they select across all these categories of traits together with beef tenderness and feed intake where appropriate recording systems are available.

3. How to maximise genetic gain across many traits

3.1 Selection Index

Adding more traits to the selection of animals may be fine for master breeders who spend virtually every waking hour wrestling with the challenge of how to breed the perfect animal. However, the more EBVs that are calculated the greater the potential for confusing the commercial bull buyer.

For this reason most livestock industries have moved towards the concept of weighting the traits for their importance to a particular production system and from this outputting an economic index (also called a selection index). This means that buyers who purchase high $index animals for their particular production systems can expect to improve their profitability. The system for doing this in BREEDPLAN is called BreedObject.

The concept that one index fits all breeds (which was until recently promoted by the Signet Service in the UK) or that one index fits all breeders within a breed is nonsense. The four Simmental populations that have installed BreedObject collectively use 9 indexes as follows:

Country	BreedObject indices used
New Zealand	Maternal Index Terminal Index
Australia	Supermarket Index Japanese Market Terminal Index
South Africa/Namibia	Self Replacing Feedlot Index Self Replacing Grassfed Index Terminal Index
United Kingdom	Self Replacing Index Terminal Index

For the New Zealand Terminal Index the following bar chart gives the weightings that are applied to EBVs and derive the Index value.

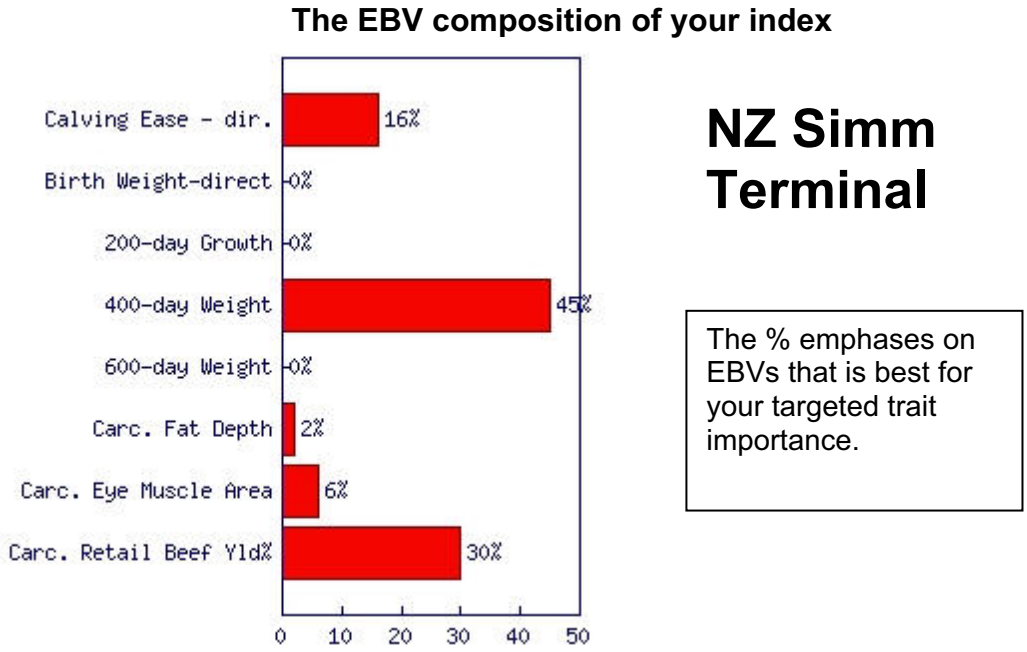
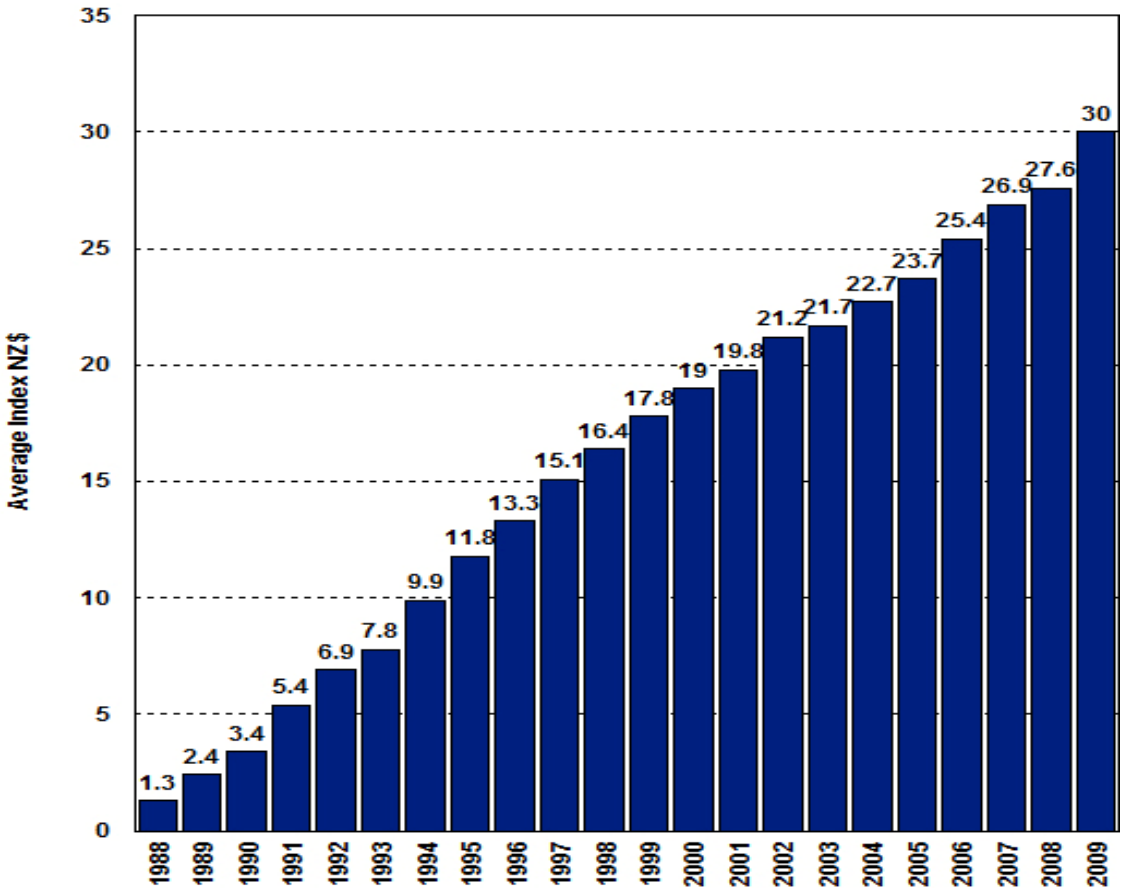


Figure 3.1 shows the genetic trend for New Zealand Simmental for the Terminal Sire Index.

Figure 3.1: Trend in NZ Terminal Sire Index



Simmental in New Zealand has made NZ$28.70 per cow genetic progress for the Terminal Index over 21 years to give breed average progress of NZ$1.37 per year. Of the 9 Selection Indexes that ABRI has computed for Simmental, the NZ Terminal Index has the fastest average rate of increase. The rate of increase is encouraging but there is still room for improvement.

Any Terminal Sire Index is much simpler than a Self Replacing Index in which it is necessary to balance cow traits with growth and carcase traits. A prerequisite to maximising selection potential from an index is the measurement of traits that are included in the index. This is reviewed in Section 3.2.

3.2 Having Sufficient Data

An issue that the Simmental breed needs to address is the quantity and quality of performance data it records. The table below shows the average number of new calves entered per year on the databases of Simmental Associations in Australia, New Zealand, South Africa/Namibia and United Kingdom and the percentage of these calves that are recorded to weaning.

Country	Average Number of new calves added per year	Average number of calves weighed at weaning per year	% Weighed
Australia	5,138	2,190	42.6
New Zealand	4,251	3,439	80.9
South Africa/Namibia			
- Simmentaler	13,222	6,761	51.1
- Simbra	12,798	7,472	58.4
United Kingdom	6,237	2,633	42.2
Total	**41,646**	**22,495**	**54.00**

Across the four countries examined 41,646 Simmental and Simbrah calves are entered on average per year and of these 22,495 or 54% are weighed to weaning. This percentage goes from a low of 42.2% in the UK to a high of 80.9% in New Zealand.

There will be many opinions on how to interpret this information. Some breeders may feel that the breed is already close to perfection – so the returns from extra recording are marginal.

My opinion, for what it is worth, is that Simmental cattle have always had excellent growth and maternal ability and so selection for these traits is quite reasonably not considered to be a high priority. This may have led to a casual attitude to performance recording. The breed can only address this by encouraging higher levels of recording particularly of fertility, mature weight and carcase traits. Australian Simmental breeders are to be commended for now recording calving ease in 92% of calf births.

3.3 Back to basics – how to make genetic progress

Genetic progress is achieved when the 'average genetic value of the offspring (eg. Your current calves) is higher than the average genetic value of the previous generation (from which the parents were selected)', Van der Werf et.al.

The formula is:

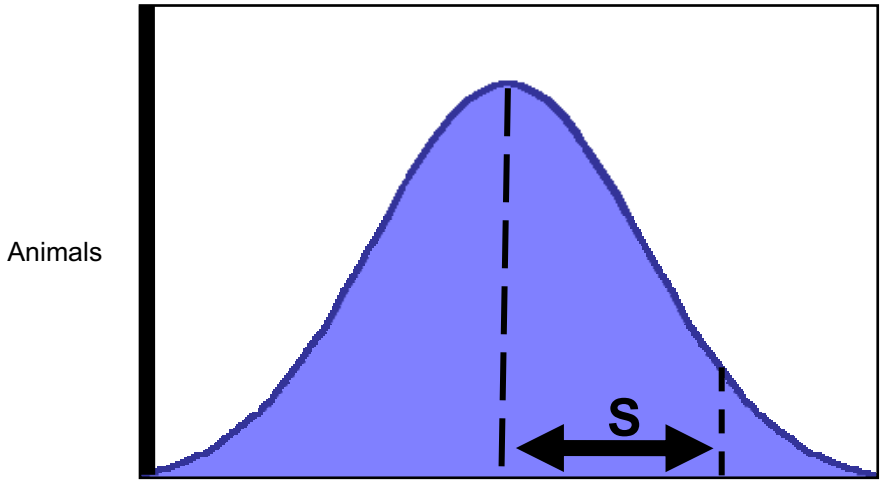
$$R = \frac{S \times h^2}{L}$$

Where:

R = Response to Selection
S = Selection Differential
h^2 = Heritability
L = Generation Length

Selection Differential is the difference between the animals selected for breeding and the average of the population from which they were selected. The greater the selection differential, the higher the response to selection (R). Recording the full range of traits appropriate to your breeding objectives will help increase the selection differential and the accuracy of selection.

Selection Differential - S



Heritability (h^2) is the proportion of the superiority or inferiority of a trait that is passed on to progeny. The higher the heritability the higher the Response to Selection (R).

Generation Length (L) is the average age of the parents (sires and dams) when their progeny are born.

The lower the Generation Length (L) the higher the Response to Selection. It is not easy to reduce L in less-intensive production systems. However, it is very easy to increase L by using Semen from 20-year old sires.

3.4 Benchmarking Genetic Progress

TakeStock® is a genetic benchmarking tool developed recently by the Animal Genetics and Breeding Unit (AGBU).

TakeStock®:

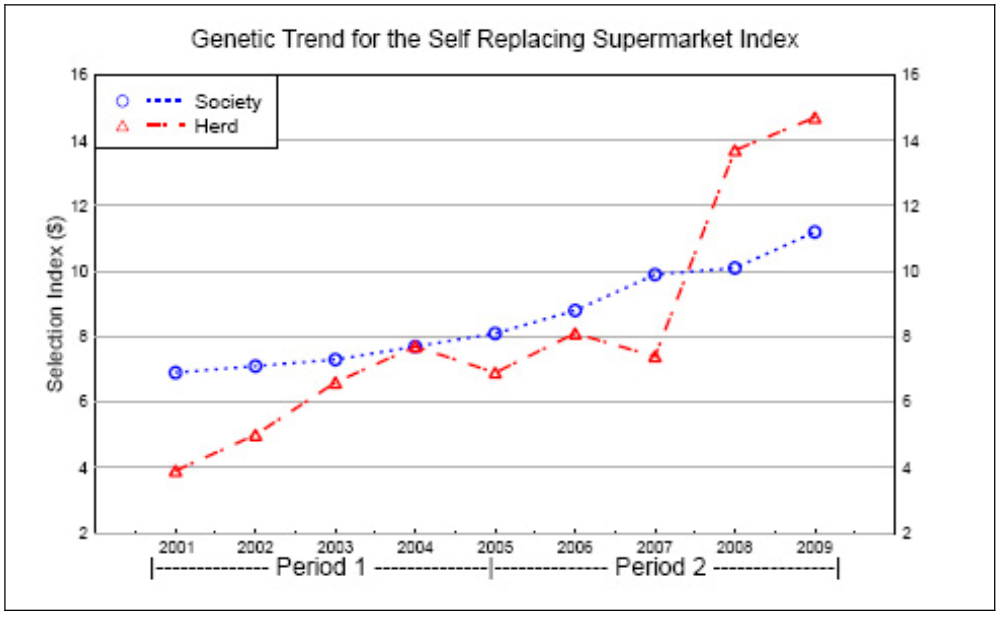
1. Evaluates the genetic progress of a herd for each particular Selection Index.
2. Benchmarks the progress of the herd against the breed.
3. Identifies Key Performance Indicators (KPIs) that explain significant differences in the rate of genetic progress between herds.

The table below shows a summary of a TakeStock® report for a Simmental herd in Australia that is using the TakeStock® benchmarking service.

Simmental Supermarket Index ~ Summary Report
(Period 1 – 2000 to 2004 & Period 2 – 2004 to 2008)

		Herd	Breed Aver
Average EBV in Period 2	Males (Bulls & Steers)	$9.73	$9.79
	Females	$10.57	$9.66
	Steers	$0	$5.97
Average EBV of parents in Period 2	Sires	$15.10	$10.86
	Dams	$4.85	$7.98
Average EBV in Period 2		$10.11	$9.72
Average EBV in Period 1		$6.01	$7.61
Genetic Progress in Period 2		$2.16	$0.58
Genetic Progress in Period 1		$0.88	$0.52
Average Herd Size in Period 2		86	58

This report shows that those herds in Simmental breed in Australia that are eligible for TakeStock have made steady but unspectacular progress with the Supermarket Index over time (in the range of A$0.52 – A$0.58 increase per cow per year). The sample herd was achieving genetic progress at 69% more than the breed average in the first period (5-9 years ago) increasing to 3.7 times the rate of progress in period 2 (1-5 years ago). A graphical representation of the trend in the Supermarket index is shown below.



Other sections of the TakeStock® report benchmark the two key components that drive genetic progress:

- Selection Differential (of Sires and Dams), and
- Generation Length

to help the breeder identify ways of improving his/her breeding program.

Clearly there is a huge opportunity for improvement of Simmental performance when individual herds are outstripping the bred average rate of improvement by a factor of 4.

3.5 Mate Selection

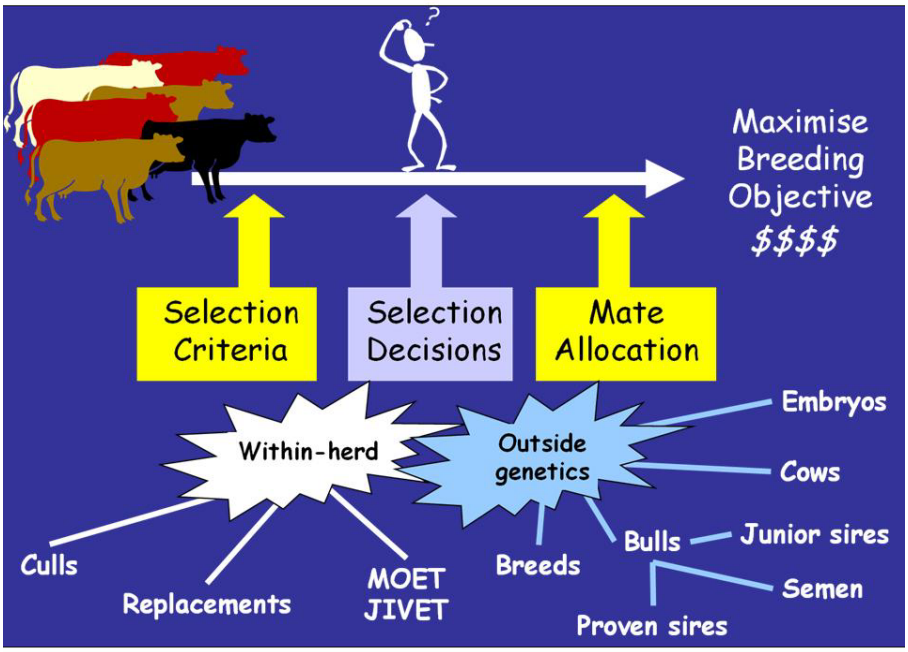
Deciding which sire to mate with each dam, which parents to use in an embryo program and which AI sires to use are the decisions that determine the future rate of genetic progress.

What if there was a software package that determined the matings that optimised genetic progress subject to certain practical restraints imposed by the breeder?

Total Genetic Resource Management (TGRM) is an example of a package that does this. Developed by a team under Professor Brian Kinghorn at the University of New England this tool is used on a routine basis in the pig and dairy industries for the last decade.

Table 3.1 gives a schematic representation of how TGRM works on the beef industry.

Table 3.1 – Schematic of how TGRM works in the beef industry



Professor Kinghorn is now writing an improved mate selection tool called MateSel which is due for release to the beef industry in August, 2011 and is expected to play a key role in helping cattle breeders accelerate their rate of genetic progress.

4. Incorporation of Gene Markers in EBVs

4.1 Background

When the Wright brothers started experimenting with heavier-than-air flying machines it has to be said that while their approach was innovative it was very crude in today's standards. But as we relax in the comfort of an A380 on an international flight we all owe a little to the Wright brothers for daring to dream about a new way to travel.

The development of genomics in the beef industry is not too dissimilar from the early attempts to fly. The early results have been underwhelming but the pace of discovery is accelerating and so we can look forward to being able to access much better products in the near future.

In year 2000, an Australian company called Genetic Solutions released a single-marker test for marbling. By 2006, this company had merged with the fledgling genomics company in New Zealand to form Catapult Genetics which provided a 12-marker panel. This included:

- 4 markers for marbling.
- 4 markers for feed efficiency, and
- 4 markers for tenderness.

The detailed results for the 12-marker panel were released on August 6, 2008 to a cattle seedstock industry seminar as part of the SmartGene for Beef Project. They may be viewed on the CRC Website – www.beefcrc.com.au.

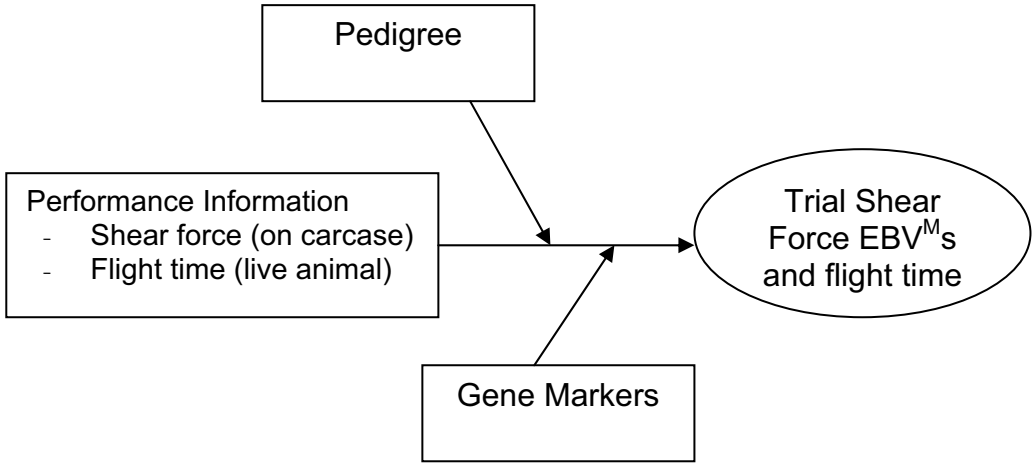
The results for tenderness markers in *Bos indicus* cattle showed the greatest promise.

About this time genomic scientists in many countries but particularly in Australia predicted that producers would simply DNA test their cattle and then use the information to determine the best way to manage their stock. In fact, the demise of breed associations within ten years was a common scientific observation. If this prediction has some substance we had best all enjoy this Congress as it may be the last.

However, what the scientists have since learned is that hundreds if not thousands of genes determine the phenotypic expression of each trait and that a more practical approach to use of DNA markers is to combine them with phenotypic measures to provide marker-assisted EBVs. Suddenly, the pendulum has swung in the other direction with more phenotypic records being required to validate DNA markers.

By October, 2008 the Animal Genetics and Breeding Unit (AGBU) had developed the methodology to combine pedigree, performance and DNA records to provide a marker-assisted EBV for tenderness which was labelled Trial Shear Force EBV^{M}s.

Figure 4.1 – Information used to calculate Trial Shear Force EBV^{M}s



These EBVs were available at Bull Week in 2008 in which over 1,000 Brahman Bulls are sold.

4.2 The Pfizer 56-marker panel

By early in 2009, Pfizer Animal Genetics had taken over Catapult Genetics. This allowed the pace of research and development to accelerate leading to the release of a 56-marker panel covering feed efficiency, marbling and tenderness. Pfizer developed Molecular Value Predictions (MVPs) for the three traits based on maker results.

The Beef Co-operative Research Centre (Beef CRC) in Armidale was engaged to evaluate the 56 marker panel using Australian cattle populations. The statistical analysis was performed by AGBU and is available on the CRC website – www.beefcrc.com.au. The proportions of genetic variation explained by the markers were:

Marbling	0 to 3.6%
Feed efficiency	0.2 to 6.2%
Tenderness	1.6 to 29.9%

That is, the 56 marker panel was better than the 12 marker panel but still of marginal utility in explaining variation in marbling and feed efficiency.

The initial publicity for the 56 panel marker made no attempt to alert users that the results may vary from breed to breed.

4.3 The Beef CRC

In 2005, scientists in Australia recognised the huge potential of genomics in the beef industry. They were successful in attracting about A$120M of funds into the Cooperative Research Centre for Beef Genetic Technologies, which is referred to in industry as the Beef CRC.

The Mission of the Beef CRC is:

"To capture the benefits of the human and bovine genome projects and the 'Livestock Revolution' by improving the profitability, productivity, animal welfare and responsible resource use of Australian and global beef businesses through world-class gene discovery and gene expression research and accelerated adoption of beef industry technologies".

At the time of the Beef CRC submission, the proposers promised that by the end of its 7-year term the Beef CRC would identify gene markers that would explain 50% of the genetic variation in a range of production traits. In the mid-term review, the Beef CRC shifted its goal to explaining "up to 15% of variation".

This does not diminish the strategic value of the research being undertaken by the Beef CRC which is now linked with similar research initiatives in North America. However, it does characterise the track record of beef genomics to date in overpromising and under delivering.

4.4 The Angus/Igenity Alliance

Igenity® is a registered trademark of Merial Ltd which is an international animal health company. It also is the product name for a range of DNA markers developed by Merial. In July, 2009 Angus Genetics Inc and Merial entered into an exclusive agreement to provide American Angus Association breeders with genomics-enhanced expected progeny differences (EPDs) across multiple traits using an Angus-specific profile of Igenity markers. The first production run was performed in December, 2009.

This is undoubtedly a significant milestone for the American beef cattle industry. It is also logical that a genomics company would develop and market breed-specific DNA profiles. The research of the SmartGene for Beef project confirmed that markers perform differently in different breeds.

The Angus/Igenity alliance is very clever in its attempt to tie up around half of the American beef seedstock industry in one agreement.

4.5 The Pfizer Response

By early in 2010, Pfizer released a higher density SNP (single nucleotide polymorphism) chip where more than 50,000 SNPs are used to calculate Molecular Value Predictions (MVPs) for 13 different traits in Angus including:

Calving ease direct	Carcase weight
Calving ease daughters	Rib Fat
Birth weight	Eye muscle area
Weaning weight	Marbling
Milk	Tenderness
Average daily gain	Dry matter intake
	Net Feed Intake

This chip was calibrated by AGBU in the first half of 2010 and it is expected that this calibration will be released soon.

However, this advanced technology is not for everyone. The indicative cost to cattle breeders will be A$195 per test.

In parallel, AGBU has developed Version 6 of BREEDPLAN which enhances our ability to calculate marker-assisted EBVs for a range of traits.

4.6 What's in the pipeline?

The 9th World Congress of Genetics Applied to Livestock Production was held in Leipzig, Germany in early August, 2010. Almost half the papers were related to genomics which is indicative of the thrust of current research and development investment.

In parallel the density of the SNP genotyping arrays has increased exponentially and the manufacturers are recognising the need to provide breed-specific chips. For example, the US Affymetrix Bovine Consortium has developed chips for a wide range of breeds as shown below:

Breed	SNPs
Afrikander	1.4M
Angus	1.4M
Ayrshire	0.96M
Blonde d'Aquitaine	0.99M
Boran	2.2M
Brahman	2.4M
Brown Swiss	0.99M
Simmental	**1.4M**
Gir	2.1M
Hanwoo	1.3M
Hereford	1.2M
Holstein	1.6M
Japanese Black	1.1M
Jersey	1.2M
Limousin	1.4M
Nelore	2.3M
Norwegian Red	1.0M
Rouge de Pres	0.7M
Romagnola	1.6M
Tuli	1.4M

So in just ten years the density of the chip has increased from 1 to 2.4M SNPs.

4.7 What is the practical way forward?

In the dairy industry genomics will make a substantial impact on herd improvement in the immediate term because:

- There are few breeds and huge numbers of production records for each breed,
- They can directly measure many of their traits of importance,
- Artificial insemination levels are high,
- Anything that reduces the time and cost of progeny testing of sires will be welcome.

In the beef industry there are many breeds and only a handful of breeds have sufficient records to validate DNA marker panels. The low number of Simmental performance records referred to in Section 3.2 could inhibit the effective use of genomics by Simmental beef breeders.

In Australia, a huge investment is commencing across the major breeds to establish Beef Information Nucleus (BIN) projects.

Essentially these projects are collecting pedigree details, detailed performance measures and DNA for progeny of a battery of young sires each year. The BINs will help validate the DNA panels being offered to individual breeds as well as stimulating genetic progress through progeny testing of young sires.

Dr Alison van Eenennaam of the University of California urges producers to think of the three P's in deciding whether to use DNA technology:

i) **Is it Possible?** What information is there that the DNA test works.

ii) **Is it Practical?** What information will be provided by the test and how will it be used.

iii) **Is it Profitable?** This is the most important question. Does the DNA information accelerate the rate of genetic progress sufficiently to pay for the cost of testing.

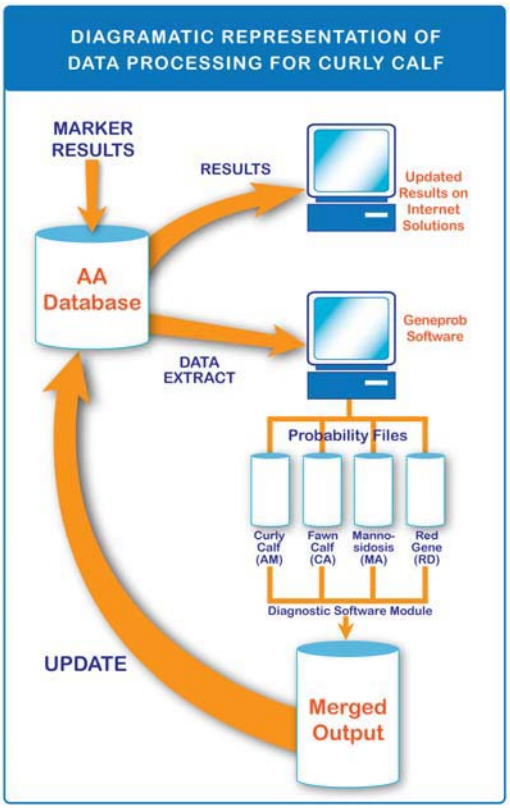
Once you have undertaken this evaluation, Melbourne's Professor Mike Goddard has some very practical advice. DNA markers should be incorporated into BREEDPLAN EBVs. Then 'Producers won't have to worry about DNA markers at all. They'll just select animals with EBVs they think are most important to their own breeding objectives', he says.

5. Minimising the impact of genetic defects

Operating at the leading edge of cattle breeding is challenging but not free of risks. When elite sires are identified on the basis of performance there is an understandable stampede to use the semen as widely as possible. But what if the sire is a carrier for a genetic defect previously unrecognised?

This happens with most breeds but it has come into sharp focus recently when a very popular Angus sire was found to be a carrier of a lethal genetic defect, Arthrogryposis Multiplex (AM) which goes by the common name of "curly calf".

Modern performance recording systems should provide a mechanism for calculating the risk of known genetic defects across the whole breeding population. ABRI has approached this issue by fully integrating an advanced software routine called Geneprob into the BREEDPLAN® pedigree/performance system as shown below.



The Geneprob software has also been developed by Professor Brian Kinghorn. It uses available gene marker tests and pedigrees to calculate probabilities of a gene (favourable or unfavourable) occurring in each animal across a whole breed association database – which may be across several million animals.

As soon as the gene marker test was found for AM, breeders started testing key animals and entering test results to the Angus Australia database. Geneprob is run at weekly intervals and the probabilities are updated to the Angus website. Very quickly the animals with a high probability of being carriers will be eliminated from the population. This will occur by either the high probability animals become unsaleable for breeding or by breeders testing them and only retaining non carriers.

The same software is able to give the probability of animals being carriers of a favourable allele such as for tenderness. Geneprob can also be used to identify candidate animals for DNA testing i.e. key animals which when tested would improve the accuracy with which gene probabilities can be calculated for rest of the breeding population.

Geneprob is now used in Australia, New Zealand, Canada and the UK.

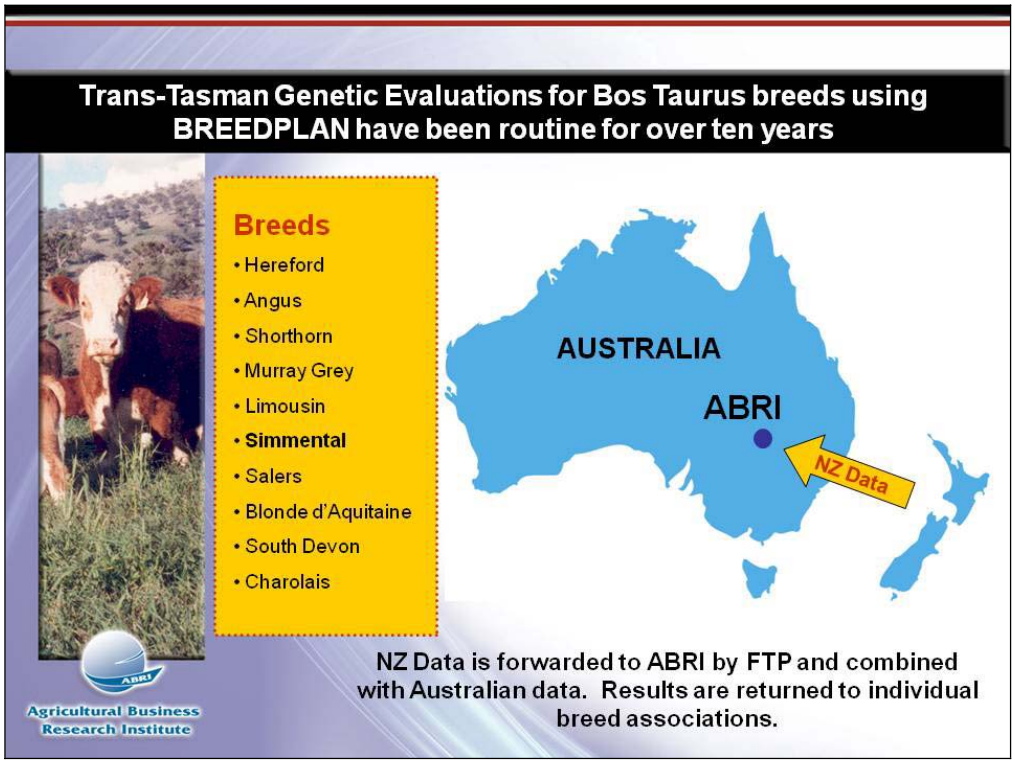
6. Across-country genetic evaluations

Across-country genetic evaluations have been in production with BREEDPLAN® and a number of other genetic evaluation agencies for two decades. This is still a rapidly developing field because the advantages to participants are both obvious and substantial.

- By increasing the number of cattle evaluated:
  - Accuracy in EBVs/EPDs calculated is increased.
  - There is a better chance of finding elite performers.
- Breeders can directly compare cattle across country borders.
- Breeders can have confidence in using genetics from another country.
- Breeders can benchmark their own herd genetics to other genetics around the world.
- Genetic progress of the breed can be accelerated where breeders use the best genetics from an international gene pool i.e. they can increase the Selection Differential.

Some examples of across-country genetic evaluations are given below.

Table 6.1: Trans-Tasman Evaluations for Bos taurus breeds using BREEDPLAN have been routine for almost two decades.



Other pairs of countries in which multiple service providers combine data for genetic evaluation include:

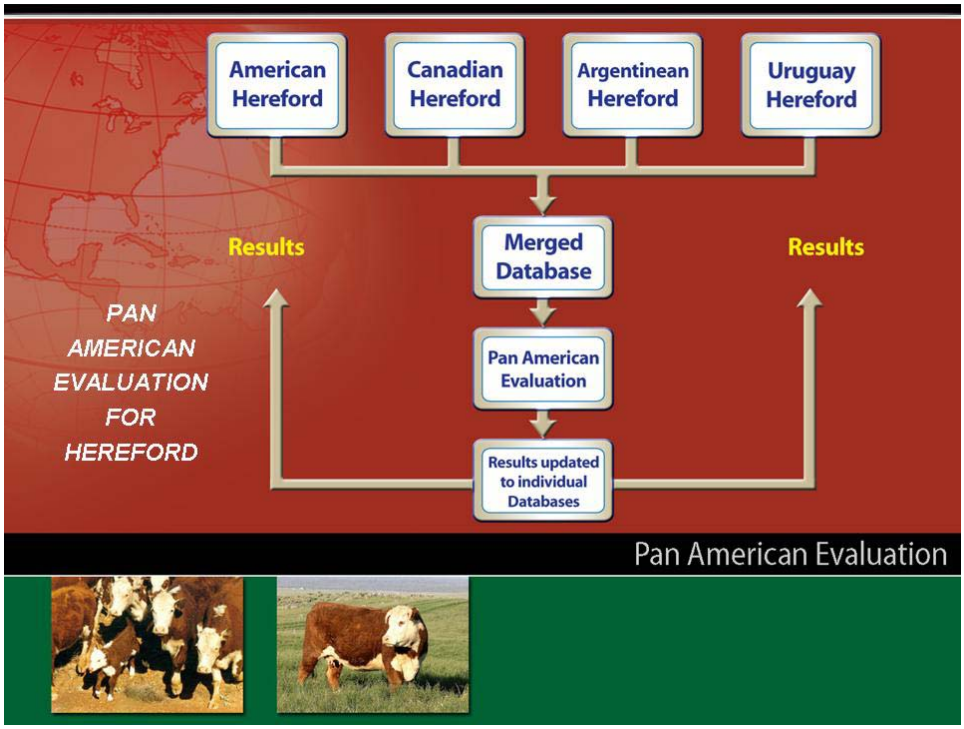
Canadian and United States of America

South Africa and Namibia

Argentina and Uruguay

A more ambitious project has been the Pan American genetic evaluation for the Hereford breed that went into production in July, 2009 following over 4 years of development work. Table 6.2 shows how it works.

Table 6.2: How the Pan American Genetic Evaluation for Hereford works



The research and development phase involved:

- Complete re-estimation of adjustment factors and genetic parameters for all 4 countries.
- Matching of all common animals, a huge task as almost 6 million animals are included in the joint analysis.
- Revise analytical software to handle country specific trait definitions, adjustment factors and heritabilities.

The production run involved a huge dataset.

Table 6.3: Data set for Pan American Genetic Evaluation of Hereford

Trait	Total Records
Birth Weight*	3.0M
Weaning Weight*	3.8M
Yearling Weight*	1.7M
Final Weight	178,000
Scrotal Size	146,000
Scan REA-FAT-IMF	173,000 (x3)
Carcase (HCW, REA, FAT, MARB)	3,100 (x4)

* Direct and maternal.

- 5.7M animals (4.3M with a record/s)
- 240,000 sires.
- 1,870,000 dams

The benefits of this evaluation are huge. For example, sires which had small sets of progeny in particular countries now have a combined progeny set of several thousand animals providing very accurate EPDs.

The American Hereford Association (AHA) has already listed all the Uruguayan sires that meet its accuracy criterion on the AHA Website.

An even more ambitious research project conducted by AGBU has been a trial Global Evaluation for the Hereford breed. This involved the data for eleven countries in a test evaluation which was released in 2008. In this model, a full set of EBVs/EPDs are produced for each trait analysed for each country. This is a 'Rolls Royce' approach and AGBU has demonstrated that the advanced methodology works. Whether there is a commercial demand for this type of global service is still an open question.

7. Internet Information Services

Use of the Internet is an integral part of any modern performance recording system. This can be used to access information, for data processing, to make decisions and to market genetics as outlined below:

Information
- Pedigrees
- EBV/EPD searches
- Photos
- Progeny lists
- Graphs of performance
- Animal points, competition results
- Benchmarking performance
- Download reports

Data Processing
- Entering Registrations
- Performance
- Disposals

Decision Making
- Mating Predictions
- Mate Selection

Marketing
- Sale Catalogues

The internet ensures that the latest information on genetics is continuously updated on a worldwide basis.

ABRI's internet information service to the seedtock sector is called Internet Solutions. It is available in a number of languages and receives 3 million pages of enquiry per month.

8. Opportunities for Simmental

I am sure that every breeder in this audience will have strong views on the opportunities for Simmental. This diversity of opinion is healthy. In my opinion, there are exciting opportunities for your breed through:

- Increasing the recording of fertility, mature weight and carcase traits to drive greater progress out of your selection indices,
- Encouraging more recording of Simmental infused cattle – the Simbra in South Africa is a wonderful success story with registrations now matching Simmentaler,
- Facilitating greater adoption of genetic benchmarking and mate selection tools to accelerate genetic progress,
- Liaising with genomics companies to facilitate the validation of Simmental-specific gene marker panels that your breeders can use with confidence,
- Reviewing the opportunities of extending the series of two-country evaluations of Simmental genetics into a more broadly based international evaluation.

Perhaps the World Simmental Fleckvieh Federation may wish to allocate some resources to considering practical ways of achieving this vision.

9. The Challenge – improving beef's market share

Much as we all love the beef cattle industry, the simple reality is that it continues to lose market share to pigs and poultry as shown in Table 9.1.

Table 9.1: World production of Beef, Chicken and Pork ('000 tons carcase equivalent)

Product	2000	2007	2008	Increase 2000 to 2008%
Beef	53,640	58,736	58,524	+9.1%
Chicken	53,057	67,753	70,748	+33.3%
Pork	85,904	95,658	97,130	+13.1%
Total	**192,601**	**222,147**	**226,402**	**+17.5%**
Beefshare	27.9	26.4	25.8	

Source: USDA

In the first 8 years of this decade, world beef production has increased by 9.1% versus increases of 33.3% in chicken and 17.5% in pork. Beef's share of production of these three meats has fallen from 27.9% to 25.8%.

In terms of exports the fall in market share has been greater as shown in Table 9.2.

Table 9.2: World Exports of Beef, Chicken and Pork ('000 tons carcase equivalent)

Product	2000	2007	2008	Increase 2000 to 2008%
Beef	5,986	7,610	7,606	+27%
Chicken	4,743	7,236	7,722	+62.8%
Pork	3,080	5,152	5,481	+78.0%
Total	**13,809**	**19,998**	**20,809**	**+50.7%**
Beefshare	43.3	38.1	36.6	

Source: USDA

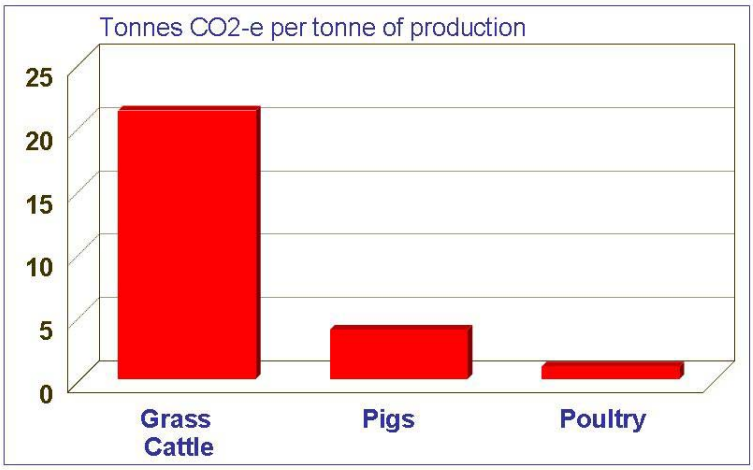
The fall of beef from 43.3% of exports of the three major meats to 36.6% in just 8 years is serious.

We need to give some close consideration to why this is happening. Not surprisingly it is mainly to do with price.

The poultry and pig industries are largely run by corporates. The livestock (birds) have a short generation cycle and multiple births per breeding female. These intensive industries employ many of the world's best geneticists who are able to crank maximum progress out of the genetic progress equation I've given in section 3.3. This reduces the cost of production and stimulates demand.

While we may not be able to match this with beef cattle, we can surely improve on what we are doing. An examination of beef cattle Sire Summaries across many countries shows that genetic progress for production traits is progressing at about +0.5% per year. The comparable figure in pig and poultry programs is up to 2.5% pa – five times the rate of gain observed with beef cattle. This genetic gain is cumulative so over 10 years it amounts to a 28% improvement in pigs and poultry. Little wonder beef is losing market share.

Another challenge for beef production is that its CO_2 emission per tonne of production is much higher than in production of pig and chicken meat. While this is a somewhat imprecise science at present, the graph below comes from a credible source.



This will become a serious economic handicap to beef production if a carbon emission tax is imposed indiscriminately.

The average rate of economic progress of Simmental cattle in the four countries evaluated by ABRI is solid but unspectacular. However, the top quartile of herds are achieving rapid gains.

Having profit-focussed beef cattle performance recording schemes in place for Simmental cattle in ALL major beef producing countries is essential to underpin the economic future of your breed.

Put another way, if you want your Simmental beef herd to be around in 50 years then it's YOUR responsibility to ensure that it maximises its use of today's beef improvement tools. Those are the very tools that will enable you to provide effective long-term competition in the world's future meat market.

World Simmental Congress 2010

ELMS
Elders Livestock Management Solutions

Elders

Improving your productivity

- There are similarities between primary production and sport
- Always looking for new tactics
- Must capitalise on what is in front of us
- Must make best use of the team
- There is continual investment in genetics, pasture improvement and marketing
- Must not lose sight of how to convert this into the only way to generate income – kilograms of beef produced
- To spend money to make money is good business.
- To spend without understanding how you will make money is not.

Elders

- Easiest way to improve bottom line is to improve what you currently produce
- This simply means getting your existing cattle to utilise the available feed more efficiently and producing more kilos of beef per hectare
- Elders involvement with the development of ELMS (Elders Livestock Management Solutions) has proven that the early set up of a ruminants stomach delivers benefit for the entire life of the animal:
  - Better weaning rates
  - Higher post weaning growth rates
  - Better available feed conversion
  - Enhanced lifetime feed and reproductive efficiency
  - Improved immunity

ELMS *(Elders Livestock Management Solutions):*

- A simple, proven concept that allows you to capitalise on the investment you have made with pastures and genetics.

What is ELMS?

Elders Livestock Management Solutions

ELMS is an advanced package of:

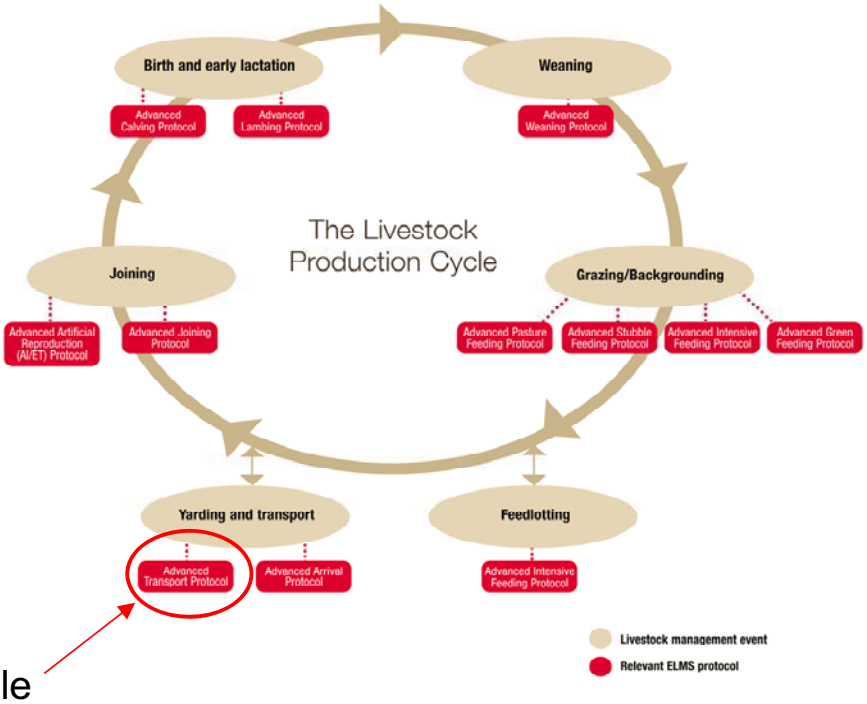
- ANIMAL PRODUCTION EDUCATION;
- PRODUCTS,
- LIVESTOCK MANAGEMENT PROTOCOLS AND PRODUCER SUPPORT PROGRAMS

ELMS delivers to our customers:

1. Best practice knowledge to primary producers on ruminant nutrition, animal health and livestock stress management,
2. A range of highly sophisticated ELMS products (from feed blocks and powder licks to pellets and liquids) matched to the specific requirements of the animal, and
3. The ELMS Protocols, which are a day-by-day, step-by-step guide to the superior management of animals at each of the key production points.

ELMS reinforces the Elders position as the "productivity partner of choice" for customers by maximising the feed conversation rate of their animals to produce more meat, wool or milk.

The Livestock Production Cycle:



Example

Advanced Travel Protocol

Critical physiological and nutritional challenges arise during handling, weaning and transport .. Leading to stress

Stressed cattle:

- significantly reduced appetite;
- limited ability to absorb critical nutrients from the diet;
- hormonal & metabolic changes increasing loss rate of fluid and critical nutrients;
- rapid increases in demand on the nervous system;
- 'burn' much more carbohydrate, stored in muscle, to meet energy requirements.

ELMS Travel & Yard Concentrate Pellet

- Supplement
  - blend of both normal and high availability forms of buffers, protein, carbohydrates, calcium, phosphorous, magnesium, sulphur, sodium, vitamin A, B group vitamins and zinc.
- Highly effective as a stand-alone supplement;
  - Feed 800 grams per head per day for 2 to 3 days prior to transport or during handling.
- Essential component of the ELMS Transport Management System
  - best results achieved if it is used in conjunction with the treatments and other management advice contained in the associated protocol.

Advanced Travel Protocol

1. Reduce liveweight shrinkage, improving profit per head
2. Minimise dark cutting meat, eliminating abattoir penalties
3. Improve animal welfare
4. Reduce animal soiling, keeping trucks cleaner
5. Decrease infectious diseases
6. Enable animals to better adapt to new surroundings

Elders

Example of ROI:

Based on a 550 kg liveweight animal with a value of $1.90/kg and $4.00 treatment cost.

ROI of $22.02 per head	
Liveweight retained	16.83 kg
Gross value	$31.97
Treatment cost	- $4.00
Net return on investment	700%
Net return	**$27.97**

Elders

ELMS

Elders Livestock
Management Solutions

Elders

Role of Simmental in Australia
Crossbreeding for Increased Beef Production

Peter Speers

Due to significant environmental variation, bos Indicus infused breeds dominate in northern Australia. These include pure and crossbred Brahman, Santa Gertrudis, Droughtmaster, Simbrah and Charbray.

By contrast, in the more temperate areas of southern Australia bos Taurus infused cattle dominate. The most numerous British breed is Angus. Others include Hereford, Shorthorn and Murray Grey. Crossbreeding is common amongst British breeds and European breeds, including Simmental, Charolais and Limousin.

In both areas:

The objective of Australian beef cattle herds is to increase productivity per cow.

This presentation outlines some of the most popular ways being used in Australia to increase herd productivity through utilising Simmental genetics.

Herds can increase productivity by increasing:

- **Fertility** – more calves weaned to cows mated and reducing calving interval
- **Growth Rate** – more weight per day of age of progeny
- **Carcase Meat Yield** – more muscle content to carcase weight resulting in higher retail beef yield
- **Carcase Meat Eating Quality** – a more consumer acceptable product (mainly tenderness) resulting in higher priced carcases

Simmental deliver these advantages in Crossbreeding programs.

Plus, Simmental has the bonus of enhanced **Maternal traits**, especially higher milk production.

- **Simmental crossbreds** **Simbeef** cattle typically display a **10% to 20%** performance gain through heterosis
- **Black and Red Simmental** provide a popular choice where solid colour and polledness is important.
- **SimAngus** is proving a popular choice where less Simmental content is preferred and to combine the best traits of both Simmental and Angus.

Simmental genetics contribute valuable benefits through both Male and Female traits:

<u>Simmental Bull Power</u> (Male traits)

- High Fertility
- Weight for Age
- Muscling

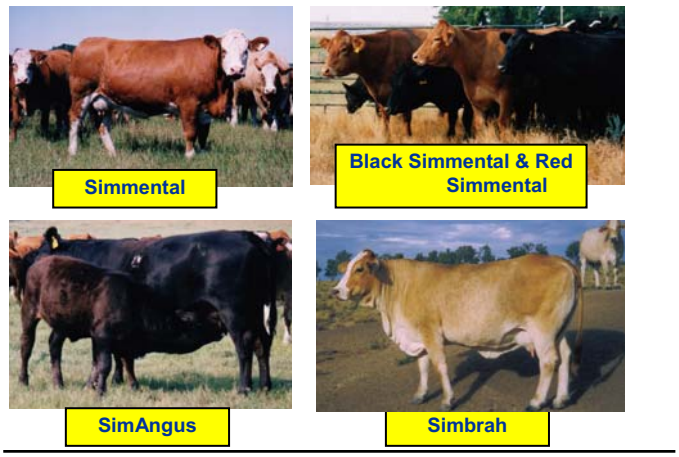
<u>Simmental Maternal Influence</u> (Maternal traits)

- High Fertility
- MILK
- Docility

Sim-Genetics Choices

Depending on the environment and beef production system, a range of Sim-Genetics options are available for use in the Australian beef breeding program:

- **Simmental**
- **Black Simmental**
- **Red Simmental**
- **Simbrah**
- **SimAngus**



Black Simmental and Red Simmental

The southern Australian beef industry has moved heavily to the use of Angus and a preference is commonly seen for black coated cattle. In some areas, solid red cattle exhibit strong popularity and white faces and coat markings are not popular.

For these reasons, Black Simmental genetics are proving popular for crossbreeding with Angus and Red Simmental for crossbreeding with red coated British breeds to largely remove white markings and to boost productivity.

These genetics enjoy the benefits of both Simmental traits and various convenience traits:

Simmental Traits	Convenience Traits
High Fertility	**Solid Colour**
More Weight for Age	**Polled**
More Muscle (2% – 4 % higher carcase yield)	**Easy Calving**
Quiet Temperament	**Early Finishing**
Excellent Maternal Traits	**Good Marbling**
High Price for cull cows	

Simbrah ~ the best of both breeds (Simmental and Brahman)

Simbrah has been developed in Australia with a range of Simmental and Brahman content from 75% to 25% respectively of each parent breed.

Simbrah enjoy the best traits of both parent breeds and are particularly suited to Australia's northern harsher environments and areas infested with cattle tick.

Compared with Brahman, Simbrah excel in:

- Weight for Age (10 to 15% advantage)
- Muscling (2% to 4% higher muscle content to carcase weight)
- Maternal – Milk & Fertility
- Adaptability
- Longevity

SimAngus (Simmental and Angus content)

SimAngus is a composite developed in Australia through structured breeding of Simmental and Angus. The most common composition is 50% of each parent breed.

SimAngus are proving increasingly popular in both USA and in the southern Australian beef industry, displaying the following advantages:

High Fertility (Bulls & Females)	**Solid Colour**
More Weight for Age (10% to 25%)	**Polled**
More Muscle (2% – 4 % higher carcase yield)	**Easy Calving**
Moderate Maturity (ideal Fat)	**Excellent Maternal Traits**
Good Marbling	**Quiet Temperament**

Research in Australia and USA has clearly demonstrated the significant production advantages of different Simmental crossbreds.

This has been particularly revealing for SimAngus and we summarise some work reported by the American Simmental Association (2004).

SIMANGUS CARCASES ARE MORE PROFITABLE

Breeding	Number Carcases Measured	Carcase Weight (kg)	Fat Depth (mm)	RibEye Area (sq cm)	Average Yield Grade (Low is best)	% Choice Grade
ANGUS	**1,077**	**342**	**13.7**	**80.0**	**3.2**	**79%**
SIMANGUS (50:50)	**2,077**	**353**	**11.2**	**85.8**	**2.7**	**75%**
SIMMENTAL	**1,253**	**355**	**9.7**	**86.5**	**2.5**	**59%**

Based on American Simmental Association research (2004)

Summary of SimAngus Advantages

- Carcase Weight 11 kg heavier and close to Pure Simmental
- Fat Depth about midway between Angus and Simmental. Leaner than Angus.
- Rib Eye Area (Muscling)close to Simmental and better than Angus
- % of carcases grading choice quality (degree of marbling), close to Angus
- Average Yield Grade much better than Angus and close to Simmental

Equates to an extra 11 kg of retail product, valued at about $77 per carcase.

Simmental Infusion Breeding Plans

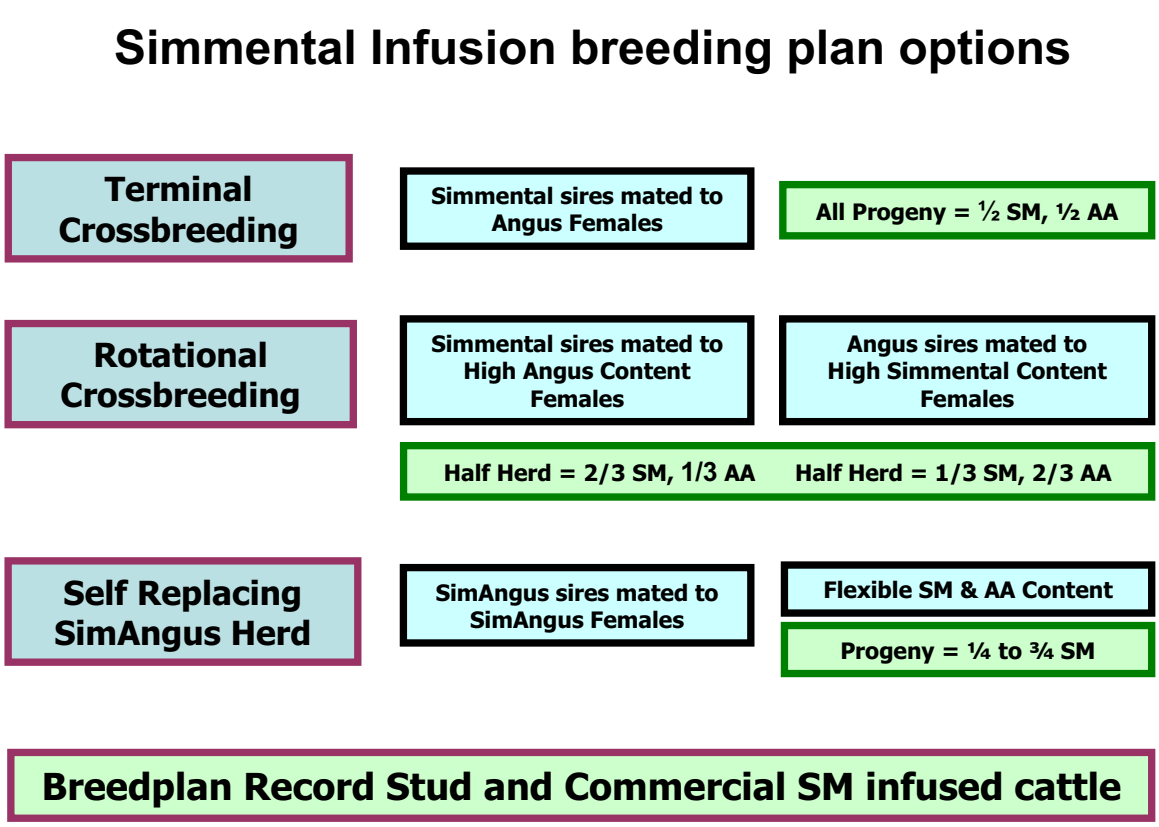
Given the significant production advantages achievable through use of Simmental genetics in a beef breeding program, producers then consider the most suitable breeding plan to use, given their herd size, environment, market and management resources.

The most popular three systems are:

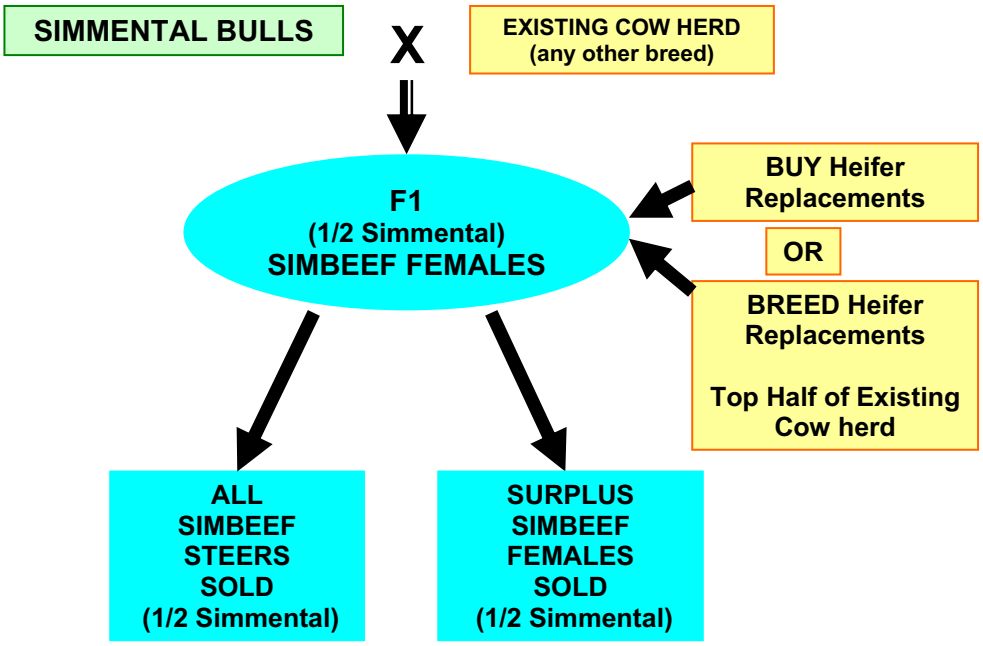
- Terminal Crossbreeding
- Rotational Crossbreeding (2 or 3 breed systems)
- Self Replacing SimAngus plan

In all these systems, the importance of utilising performance measured bulls (Breedplan) and monitoring within herd breeder performance, will enhance overall herd productivity.

These Breeding Plans are outlined below.



Terminal Crossbreeding with Simmental



Terminal crossbreeding with Simmental

This is the most common crossbreeding system, with "other breed" females mated to Simmental bulls and all Simbeef F1 progeny sold.

The Terminal Crossbreeding system is easy to design and manage, maintaining a consistent 50% content of each parent breed.

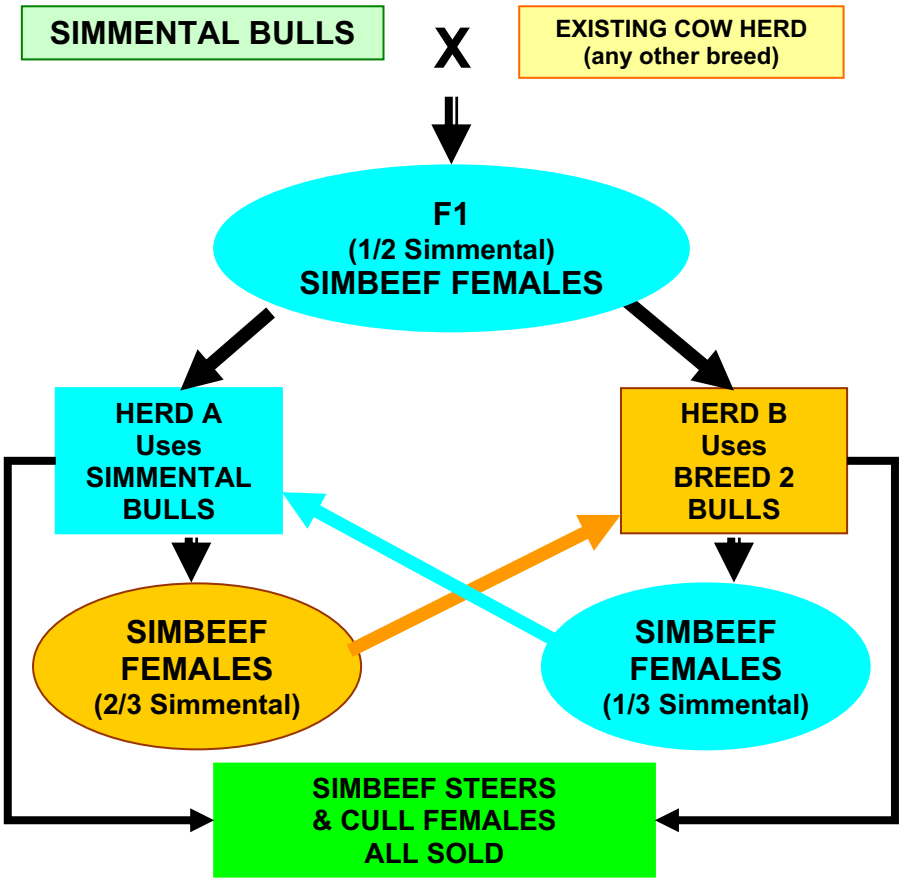
This system is a popular means of boosting productivity of Hereford, Angus, Shorthorn, Brahman, Braford, Santa Gertrudis, and dairy breeds.

An added feature of these Terminal crossbreeding programs, is that the heavier, leaner, better muscled Simbeef F1 heifer progeny often fetch similar prices per kg as do steers of these other breeds. They are also in strong demand as replacement breeding females.

As all progeny are sold from the herd, replacement breeding females need to be purchased, and it is not always easy to find a reliable source of good quality replacements at a suitable price.

Alternatively, these replacements need to be bred from the original purebred herd, and this limits potential overall productivity gains.

Rotational Crossbreeding with Simmental



Rotational crossbreeding with Simmental

Rotational Crossbreeding programs are a natural progression from the use of a Simmental bull as a Terminal sire. They are designed to stabilise the Simmental content whilst maintaining a high level of hybrid vigour.

Typically, these programs increase productivity by 20% to 25% relative to the original straightbred herd. Simbeef progeny contain between 25% and 75% Simmental, providing a variation in maturity pattern and access to a range of target markets.

The programs capitalise on the superior maternal qualities of the Simmental, including Milk, mothering ability and high fertility traits.

A major benefit with these programs is that replacement females can be selected from within the program rather than purchasing them or retaining another straightbred herd to produce them.

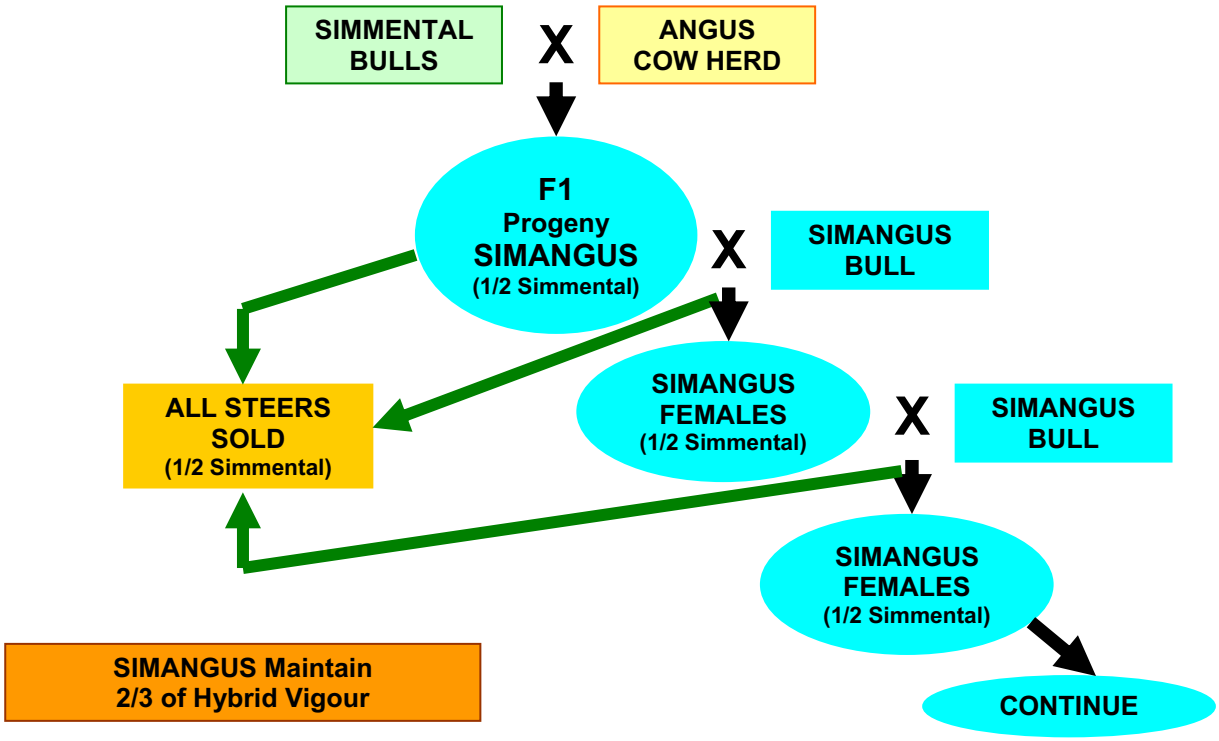
Rotational crossbreeding systems are long term and can be tailored to meet the needs of the individual herd, environment and target market requirements.

After several generations, a typical SIMBEEF program stabilises with

- Half the progeny = 2/3 SIMMENTAL content
- Half the progeny = 1/3 SIMMENTAL content

SimAngus

Straight Breeding Program ~ Self Replacing



SimAngus ~ Straightbreeding self replacing program

After breeding the initial F1 (Simmental X Angus) females, the breeding program remains simple. These females and all subsequent replacement females produced in the program are mated to SimAngus bulls.

Most SimAngus will be about 50% Simmental and 50% Angus. Yet the breeding program remains flexible, with most progeny retaining about 2/3 of potential F1 hybrid vigour levels.

Where more Simmental content is required in the progeny, SimAngus bulls with more Simmental content are used.

Conversely, lower Simmental content SimAngus bulls can be used to reduce the Simmental content of the progeny.

All steer progeny and surplus female progeny are sold for fattening or slaughter.

Services Provided by Simmental Australia

- **Website** www.simmental.com.au
  - **Breed Information**
  - **Animal Search Facility**
  - **Members Directory**
  - **Sales and Events**
- **Provide Registration Certificates**
- **Provide Breedplan Reports**
  - **with EBVs** (Estimated Breeding Values for many Production Traits)

Harmonisierung Exterieur –
für alle Nutzungsrichtungen
harmonising conformation traits –
for beef and milk purpose

World Simmental - Fleckvieh Congress

Melbourne 2010

Bernhard Luntz, Bavarian State Research Center for animal breeding

Themen:
Topics:

1. **Zusammenarbeit in Europa**
   Cooperation in Europe

2. **Anforderungen an die Exterieurbeschreibung**
   Conformation requirements

3. **Zuchtrichtung Fleisch: was kann man übernehmen?**
   beef breeding: what could be taken over?

System Zweinutzung in Europa:

System dual purpose in Europe:

10 Länder benutzen das gleiche Klassifizierungssystem

10 countries use the same system

Vorteile:

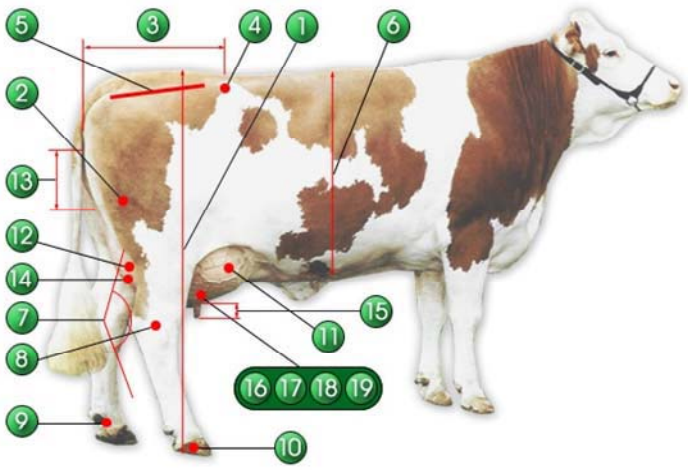
advantages:

- Einheitlichkeit über Ländergrenzen(uniformity over countries)
- somit volle Vergleichbarkeit der Einstufung(comparability of klassification)
- Förderung des Genaustausches(genetic exchange gets advanced)
- Stärkung der Rasse(enhancement of the breed)
- Voraussetzung einer gemeinsamen Zuchtwertschätzung(condition for common evaluation)

One Cow – one result

Definierte Punkte zur exakten Beschreibung

Defined points for a accurate description



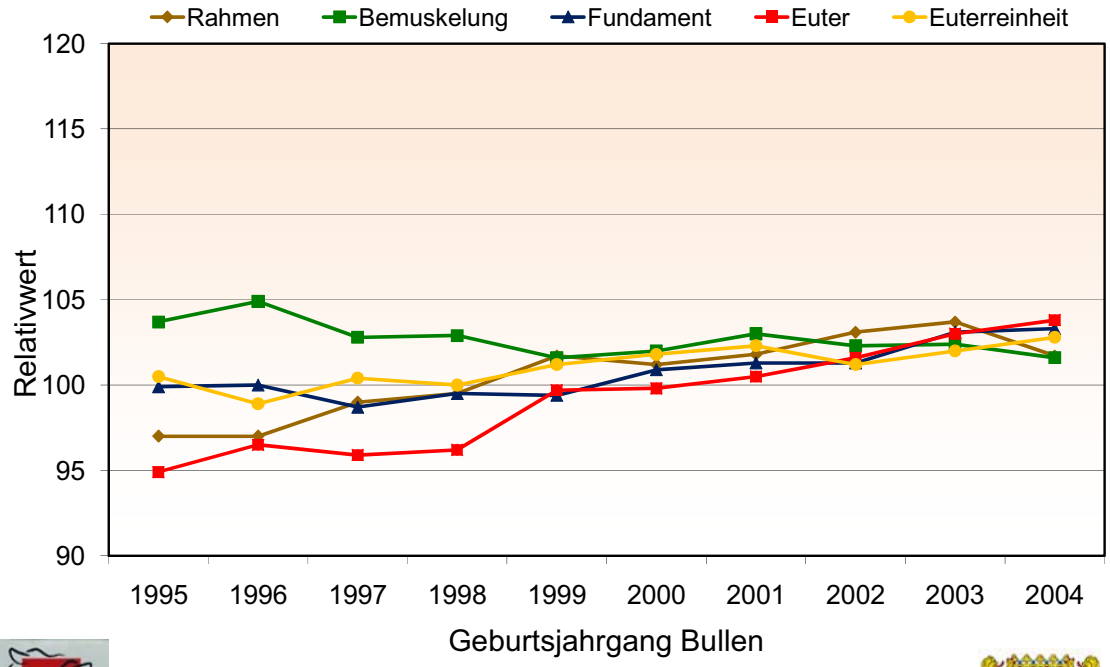
Regelmäßige Schulung derBewerter innerhalb Europas
regular Workshop for experts within Europe

Große Populationen – ein Garant für effektive Zuchtprogramme
Big population – guarantees an effective breeding programm

Anzahl Fleckviehkühe in der gemeinsamen Zuchtwertschätzung Exterieur in Europa (2009)
Quantity of Simmental cows in the common evaluation for conformation in europe (2009)

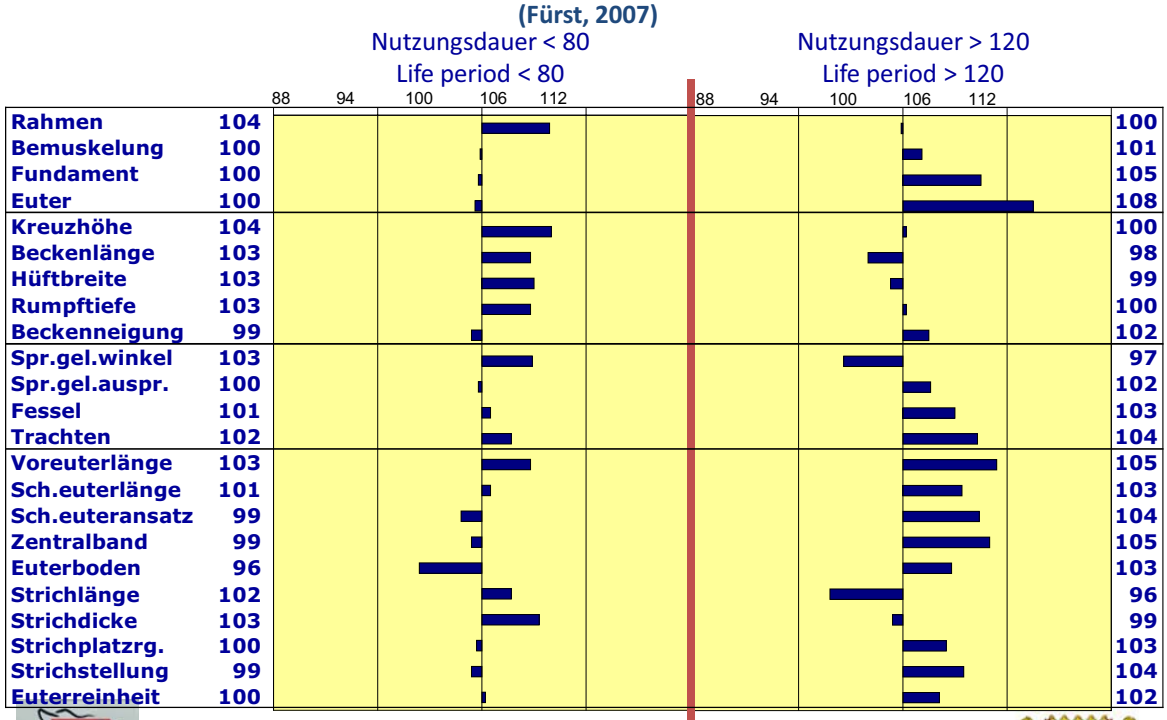
Land country	Anzahl number
Baden –Württemberg	12 483
Österreich	12 511
Italien	7 306
Bayern	40 791
Alle total	73 091

Genetische Trends für Fleckvieh in Bayern
genetical trend of conformation in Bavaria

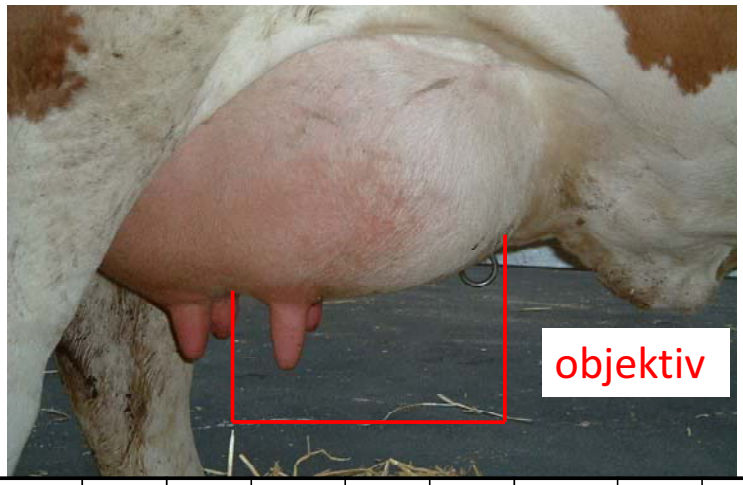


Nutzungsdauer – Exterieur / Life period - conformation

(Fürst, 2007)



Beispiel: Beschreibung Voreuterlänge nach definierten Meßpunkten
For example: description of the trait „front udder" according to measuring points



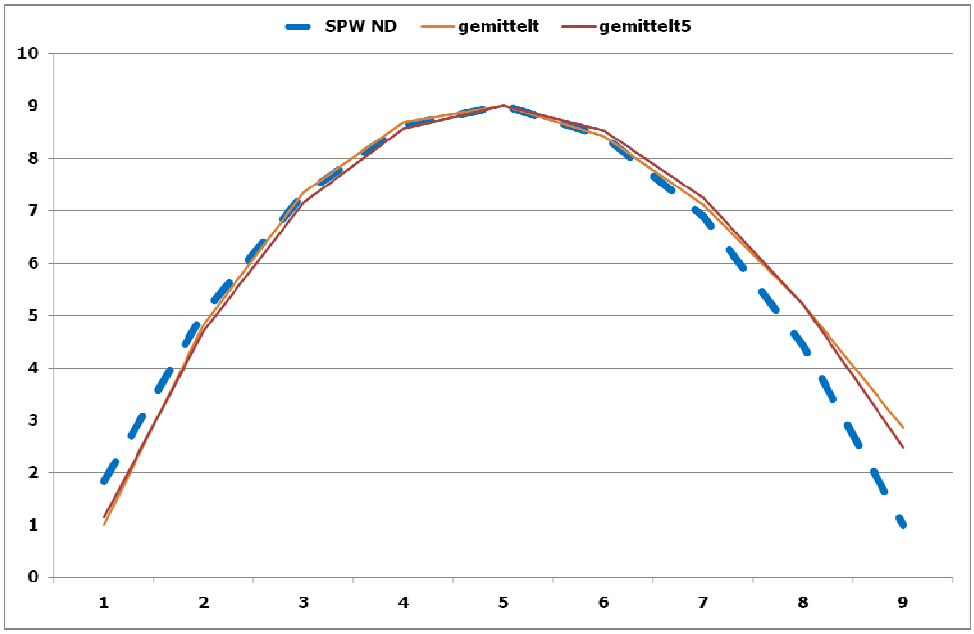
Ziffer	1	2	3	4	5	6	7	8	9
cm	12	14	16	18	20	22	24	26	28

Lineare Beschreibung Fundamentmerkmale
Linear description of feet & legs

Sprunggelenks-winkelung Hook angularity	 1 = sehr steil	 5 = mittel	 9 = sehr stark gewinkelt

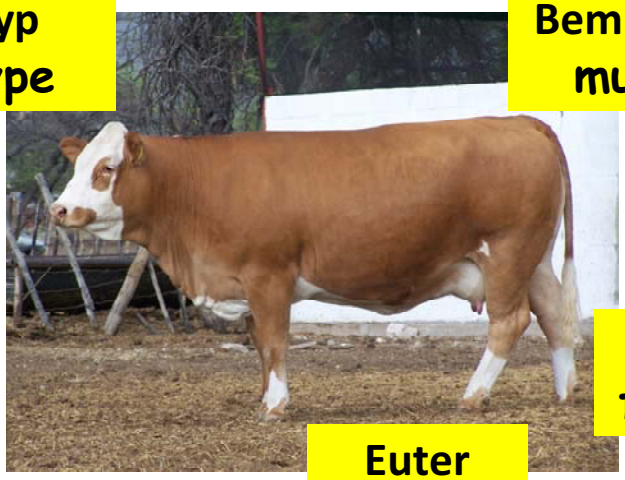
Fessel Fetlock	 1 = stark durchtrittig	 5 = leicht federnd	 9 = sehr steil

Nutzungsdauer in Abhängigkeit von Sprunggelenkswinkelung
Life period in dependency of hook angularity



gemittelt5
1,14202377
4,71050861
7,16074945
8,56612151
9
8,53576013
7,2467771
5,20642615
2,48808246

Vorschlag: Schema zur Klassifizierung Fleckvieh-Fleisch
Proposal: shedule for classification Beef Simmental



Schlechtes Euter mit dicken Zitzen
Bad udder with thick teats

Gutes Euter mit korrekten Zitzen
Favoured udder with correct teats

Bewertungsschema Kühe / conformation schedule cows

Hauptmerkmal main traits	Einzelmerkmale Single Traits	Punkte scores	Komplexnote scores	Gewichtung weight
TYP type	Kreuzbeinhöhe (height)	1 - 9	65 – 99(?)	25 %
	Beckenbreite (width)			
	Beckenlage (Rump angle)			
	Rumpftiefe (body depth)			
	Oberlinie (upper line)			
BEMUSKE-LUNG muscling	Keule (haunch)			25 %
	Rücken/Lende (back)			
	Vorhand (shoulder)			
FUNDAMENT feet	Sprunggelenkswinkelung (hock angularity)			25 %
	Sprunggelenksausprägung (hocks)			
	Fessel (foot angle)			
	Klauentracht (claws)			
EUTER udder	Euterboden (udder depth)			25 %
	Zentralband (ligament)			
	Zitzengröße (teats)			

Final Score

Bewertungsschema Bullen / conformation schedule bulls

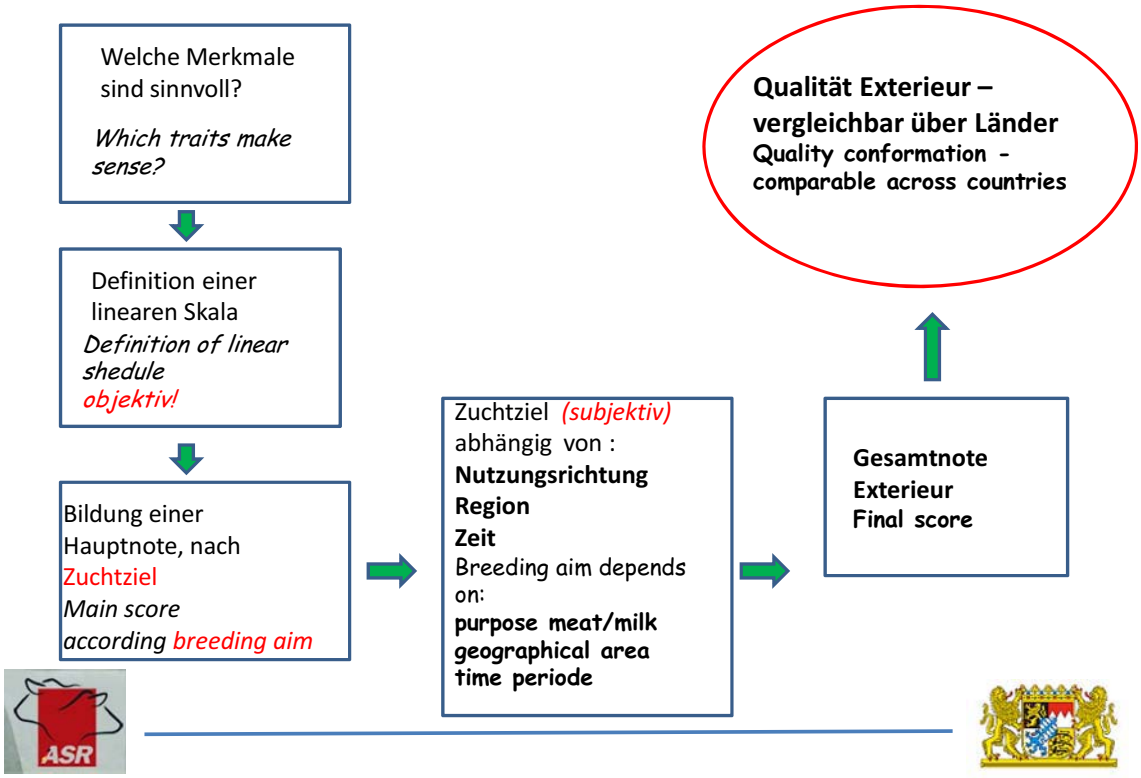
Hauptmerkmal main traits	Einzelmerkmale Single Traits	Punkte scores	Komplexnote scores	Gewichtung weight
TYP type	Kreuzbeinhöhe (height)	1 - 9	65 – 99(?)	30%
	Beckenbreite (width)			
	Beckenlage (Rump angle)			
	Rumpftiefe (body depth)			
	Oberlinie (upper line)			
BEMUSKE-LUNG muscling	Keule (haunch)			35 %
	Rücken/Lende (back)			
	Vorhand (shoulder)			
FUNDAMENT feet	Sprunggelenkswinkelung (hock angularity)			35 %
	Sprunggelenksausprägung (hocks)			
	Fessel (foot angle)			
	Klauentracht (claws)			

Final Score

Nicht den Rahmen sprengen
not to go over the top

Gewünschter Typ: mittelrahmig mit harmonischen Proportionen
desired type: medium size with harmonic measures

Wie kann ein gemeinsames Ziel erreicht werden?
How to achieve a common aim?



Vorteile:
Advantages:

- Austausch von Genetik weltweit wird gefördert
  global exchange of genetics
- Zusammenarbeit in den Zuchtprogrammen
  cooperation between breeding programms
- Stärkung der Rasse Fleckvieh zukünftig
  enhancement of simmental in future

Zitat Gregory S. Nolan (WSFF – E Member Jornal) :

`` THINK GLOBALLY - ACT LOCALLY ``

Vielen Dank für Ihre Aufmerksamkeit

Thank you for your attention

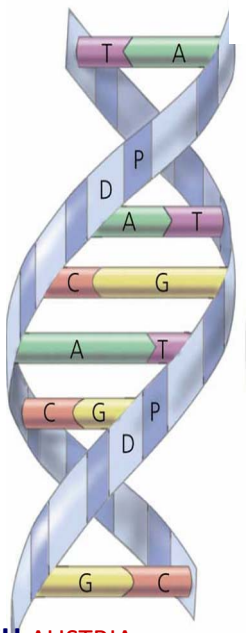
Genomische Selektion

Fleckvieh

Genomic Selection

World Simmental - Fleckvieh Congress

Melbourne 2010



Johann TANZLER, AGÖF - **FLECKVIEH** AUSTRIA

Vision der Züchter / *Breeders Visions*

Kenntnis der Erbanlagen von Zuchttieren / *Knowledge about genetics*

- möglichst früh / *early*
- möglichst genau / *exact*
- möglichst kostengünstig / *cheap*

Methoden / *methods*

- Leistungsprüfung + Zuchtwertschätzung / *Milk recording + genetic evaluation*
- Statistische-genetische Methoden / *Statistics and genetics*
- Neu: Genomische Zuchtwerte / *New: Genomic breeding* values

Entwicklungsschritte/ *Steps*

1. Schätzung der SNP-Effekte an dieser Stichprobe
   Estimation of SNP-effects
2. Bestätigung der Schätzer, Validierung, Cross-Validierung-Validierung – *Validation of results*
3. Validierung im Datensatz / *Validation on data*
4. Echte Validierung / *Real Validation*
   Schätzung der genomischen ZW an Wartestieren
   Estimation of genomic values before progeny test is finished
5. Kontinuierliche Berechnung der Formel (3 x J) und der genomischen Zuchtwerte (12 x J)
   Calculation of formula (3 x year) and genomic values (12 x year)

Projekte / projects

- **Projekt in Austria (Partner**: AGÖF, BOKU, ZuchtData EDV-Dienstleistungen GmbH)

- **Projekt in Germany** (Genotrack)

ZWS Deutschland/Österreich
(München-Stuttgart-Wien)

Automatisierung Liquidhandling/Storage

Genotype Pool Fleckvieh 4.440

1.894 AGÖF - Federation of Austrian Fleckvieh Breeders
ZuchtData EDV-Dienstleistungen GmbH

662 ASR - Federation of Cattle Breeders in Southern Germany

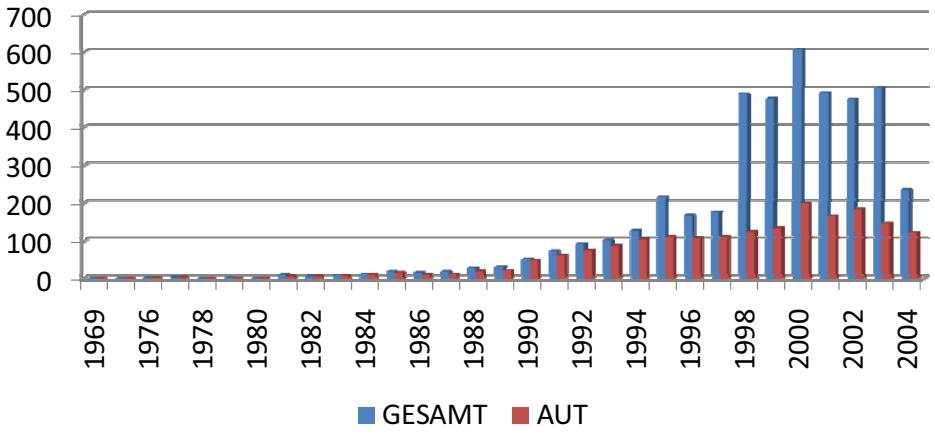
706 FBF - Förderverein Biotechnologieforschung

601 Institute of Animal Breeding
(Bavarian State Research Center for Agriculture)

577 Institute of Animal Breeding and Husbandry
(Christian Albrecht University Kiel)

Pool / *Number of genotypes*

AUT/DEU : n = 4.400



ZWS DEA

- MILCH / *Milk*
- FLEISCH (+ CZ, HU) / *Beef*
- FITNESS / *Functional traits*
- EXTERIEUR (+ IT) / *Conformation*
- Gesundheitszuchtwerte / *Health traits*
- Exterieur – Zweitbewertung / *Conf. 2nd evaluation*

BLENDING → offizieller Zuchtwert (genomischer Zuchtwert)
Official breeding values

Methoden / *methods*

- G-BLUP
- BAYES-B
- Haplotypenansatz / *haplotype approach*
- Andere / *Others*
- Suche nach einzelnen Genen bzw. effizienter Marker z.B. gegen Erbfehler / *Search for single genes, markers e.g. for genetic defects*
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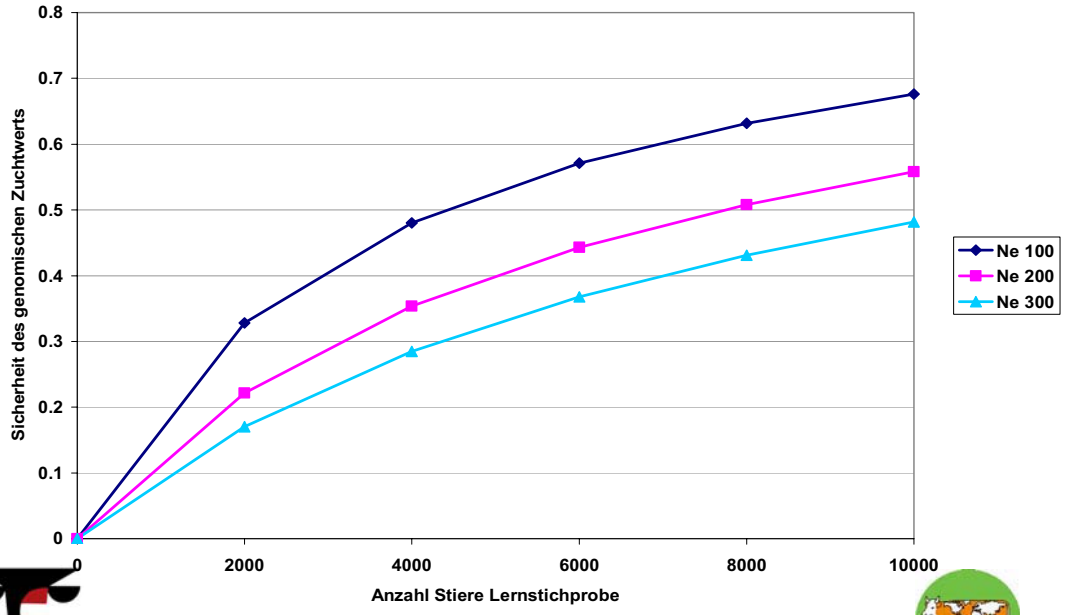

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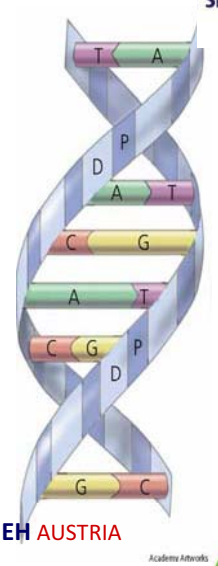
Genomische Selektion

Fleckvieh

Genomic Selection

World Simmental - Fleckvieh Congress

Melbourne 2010



Johann TANZLER, AGÖF - **FLECKVIEH** AUSTRIA

Vision der Züchter / *Breeders Visions*

Kenntnis der Erbanlagen von Zuchttieren / *Knowledge about genetics*

- möglichst früh / *early*
- möglichst genau / *exact*
- möglichst kostengünstig / *cheap*

Methoden / *methods*

- Leistungsprüfung + Zuchtwertschätzung / *Milk recording + genetic evaluation*
- Statistische-genetische Methoden / *Statistics and genetics*
- Neu: Genomische Zuchtwerte / *New: Genomic breeding* values

Entwicklungsschritte/ *Steps*

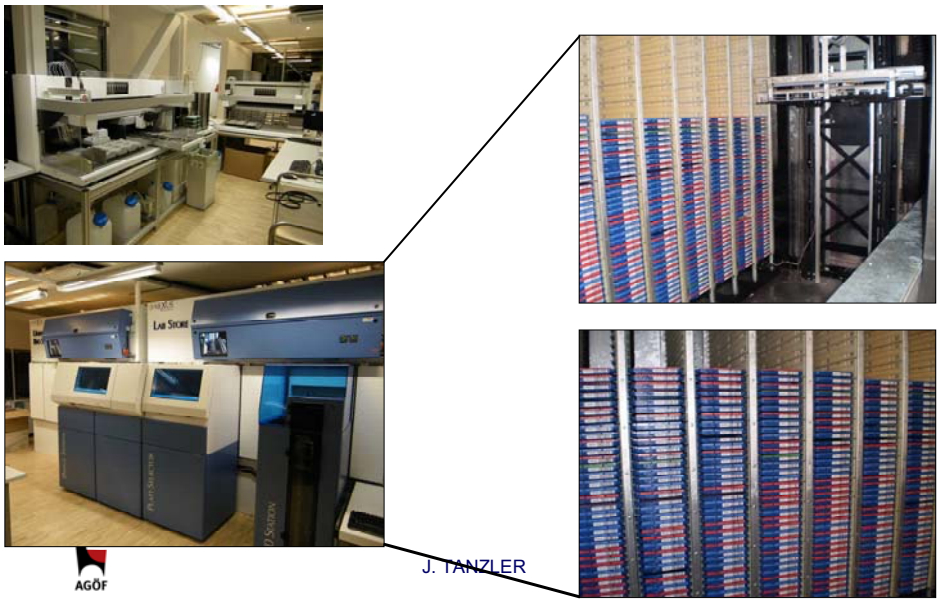
1. Schätzung der SNP-Effekte an dieser Stichprobe
   Estimation of SNP-effects
2. Bestätigung der Schätzer, Validierung, Cross-Validierung-Validierung – *Validation of results*
3. Validierung im Datensatz / *Validation on data*
4. Echte Validierung / *Real Validation*
   Schätzung der genomischen ZW an Wartestieren
   Estimation of genomic values before progeny test is finished
5. Kontinuierliche Berechnung der Formel (3 x J) und der genomischen Zuchtwerte (12 x J)
   Calculation of formula (3 x year) and genomic values (12 x year)

Projekte / projects

- **Projekt in Austria (Partner**: AGÖF, BOKU, ZuchtData EDV-Dienstleistungen GmbH)
- **Projekt in Germany** (Genotrack)

ZWS Deutschland/Österreich
(München-Stuttgart-Wien)

Automatisierung Liquidhandling/Storage

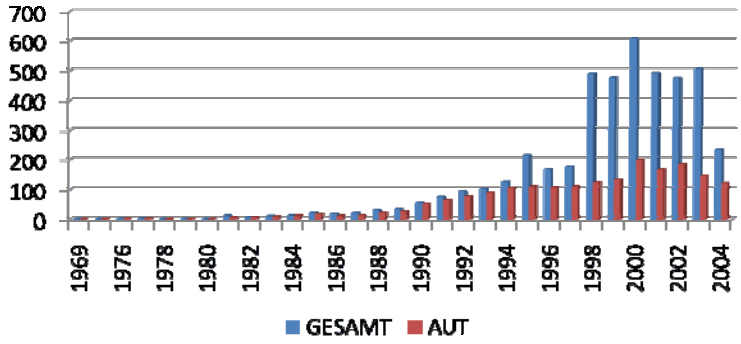


Genotype Pool Fleckvieh 4.440

1.894	AGÖF - Federation of Austrian Fleckvieh Breeders ZuchtData EDV-Dienstleistungen GmbH
662	ASR - Federation of Cattle Breeders in Southern Germany
706	FBF - Förderverein Biotechnologieforschung
601	Institute of Animal Breeding (Bavarian State Research Center for Agriculture)
577	Institute of Animal Breeding and Husbandry (Christian Albrecht University Kiel)

Pool / *Number of genotypes*

AUT/DEU : n = 4.400



ZWS DEA

- MILCH / *Milk*
- FLEISCH (+ CZ, HU) / *Beef*
- FITNESS / *Functional traits*
- EXTERIEUR (+ IT) / *Conformation*
- Gesundheitszuchtwerte / *Health traits*
- Exterieur – Zweitbewertung / *Conf. 2nd evaluation*

BLENDING → offizieller Zuchtwert (genomischer Zuchtwert)
Official breeding values

Methoden / *methods*

- G-BLUP
- BAYES-B
- Haplotypenansatz / *haplotype approach*
- Andere / *Others*
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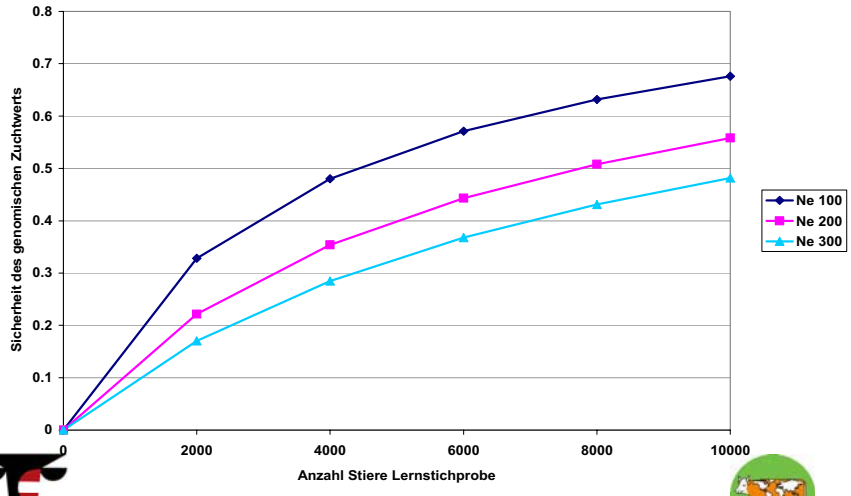

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