



SELECTION ADAPTED TO LOCAL CONDITIONS HAS THE POSSIBILITY TO IMPROVE THE ECONOMY OF SMALL DAIRY CATTLE BREEDS

Klemen Potočnik

Topics

- ✘ Some facts and trends about cattle selection
- ✘ Classic & Genomic selection
- ✘ Niche production - examples
- ✘ Discussion

Facts about cattle breeding in Slovenia

- Self efficient with milk and milk
- Cattle population:
 - 450.000 cattle
 - 160.000 cows (25.800 farms – mean=6,2)
 - 60.000 suckle cows (19.200 farms – mean=3,1)
 - 100.000 dairy cows (6.600 farms – mean=15,2)
 - 80.000 milk recording cows

EU 23 mio

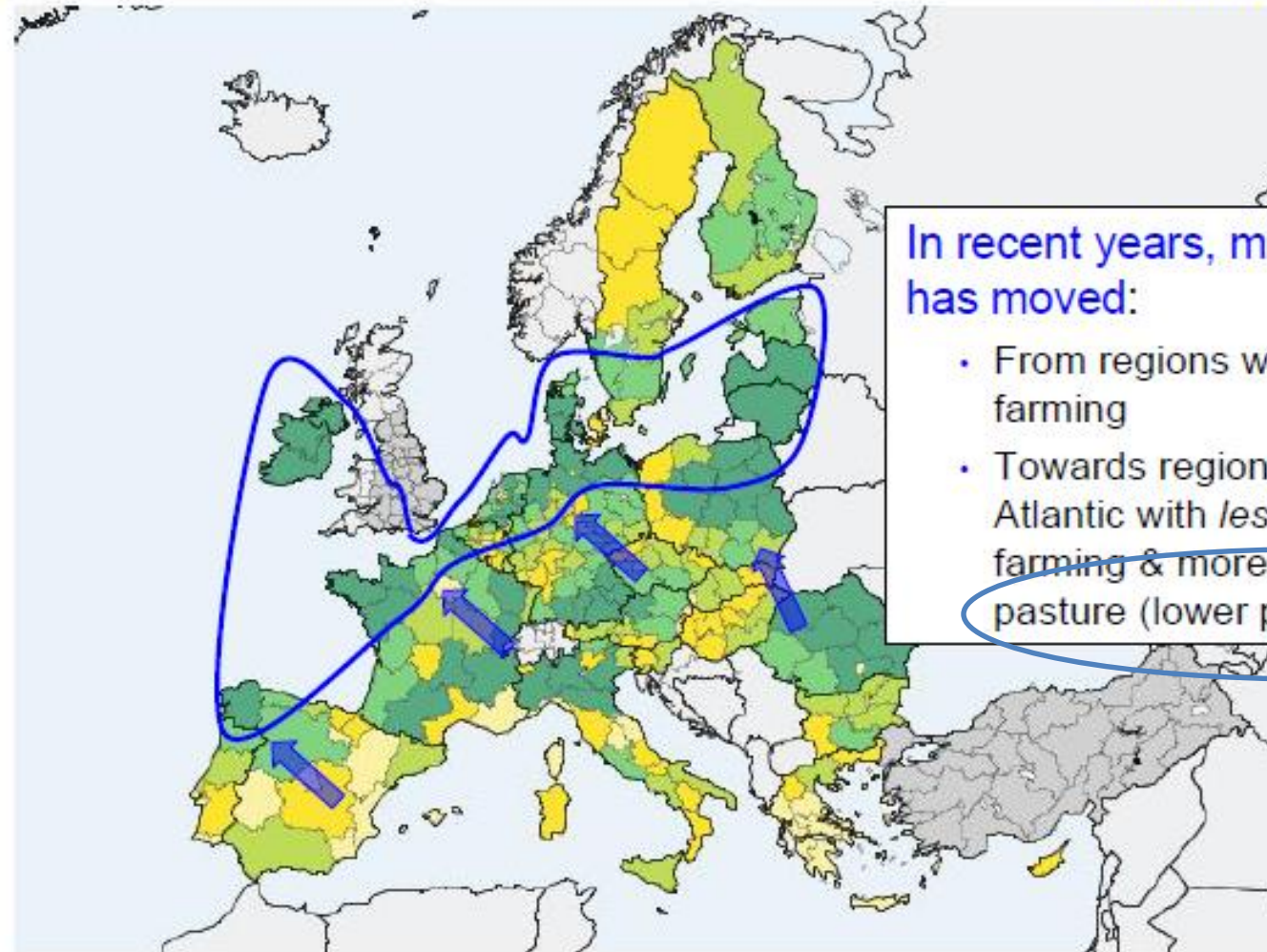
No selection!

Breed	Σ %	Dairy	Suckle	N calving's ML	MI kg
HOL	17.5	34,400	0	3.1	7,400
BSW	7.0	12,300	2,500	3.9	5,500
SIM	39.0	40,300	32,800	3.7	5,700
Other	36.5	13,000	24,700	3.3	6,000

TRENDS IN EUROPE

Regional movements in EU Milk Production

Movement continues to Atlantic regions with less intensive farming



In recent years, milk production has moved:

- From regions with *intensive* farming
- Towards regions around the Atlantic with *less intensive* farming & more land suitable for pasture (lower production costs)

Légende

0.0 - 13.8

13.8 - 37.1

37.1 - 78.4

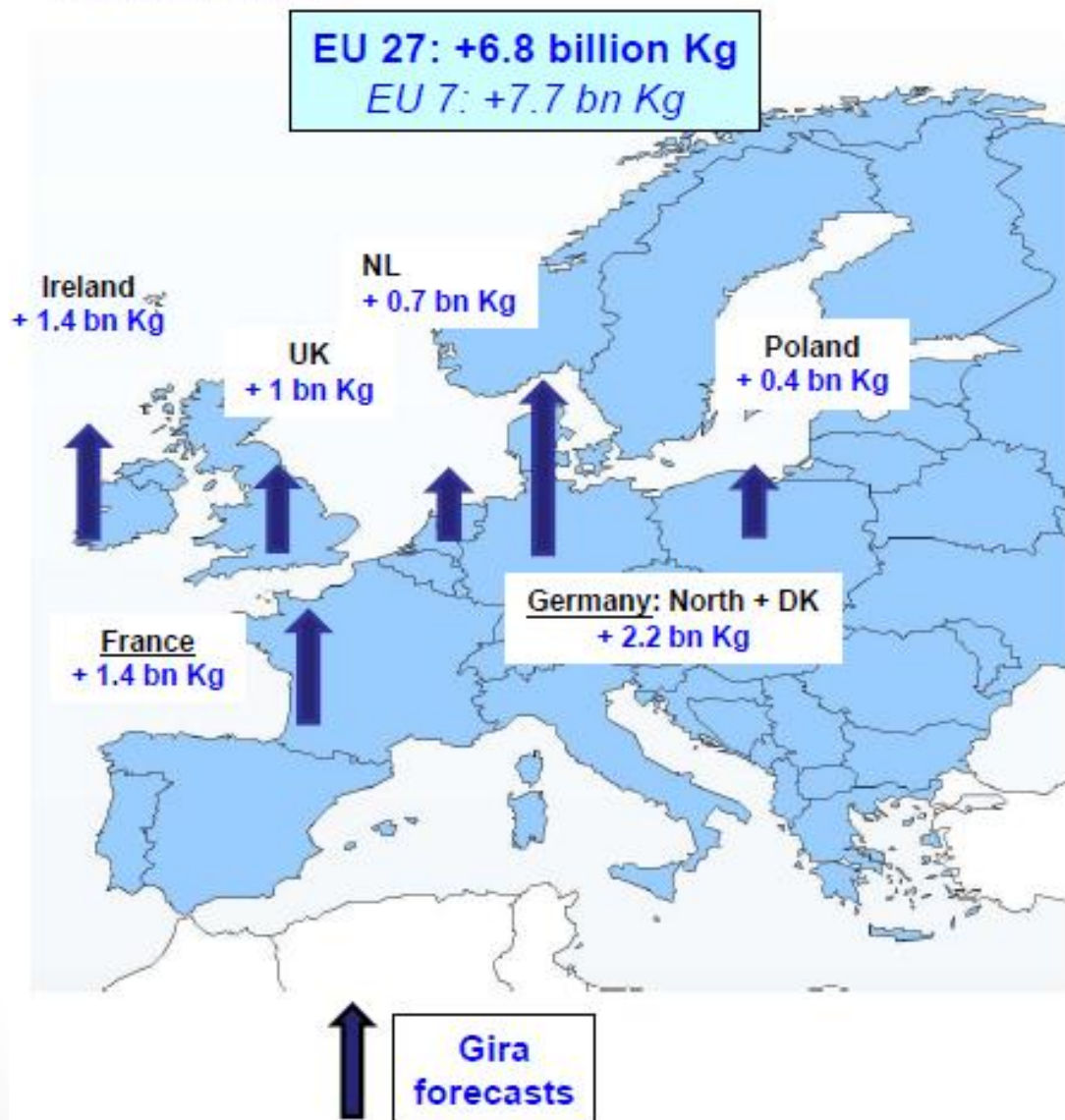
78.4 - 133.0

133.0 - 864.0

N/A

Source: Eurostat

Gira's forecasts for milk collection in 2016 compared to 2011



Ireland (+4.7% p.a. 2011/2016)

The UK (+1.4%):

France (Brittany) (+1.1%):

The Netherlands (+1.2%):

Germany (+1.4%):

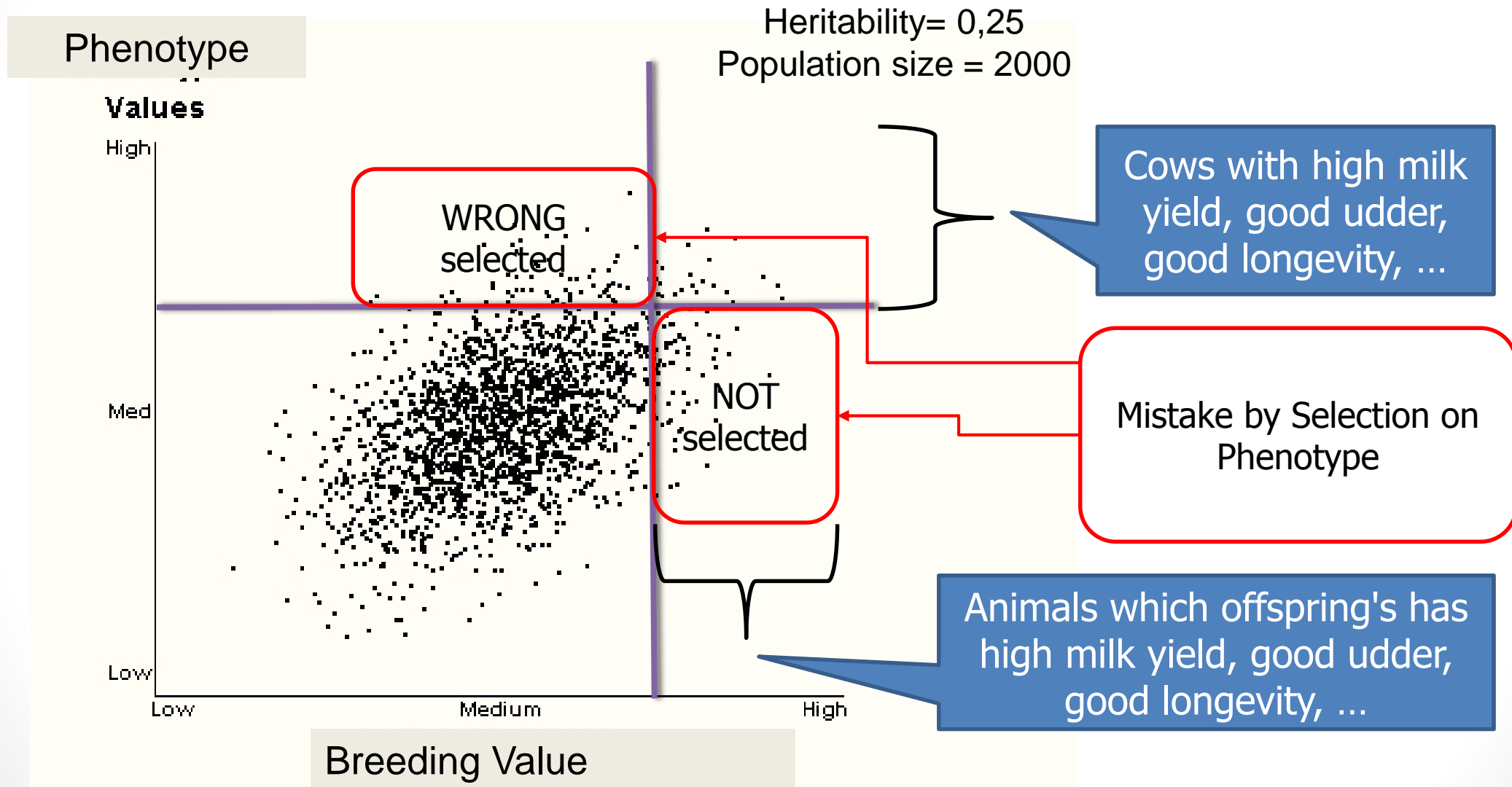
Poland (+0.9%):

The rest of the EU: (-0.6%): -0.9 bios Kg by 2016

Phenotype or Breeding Value as selection criteria?

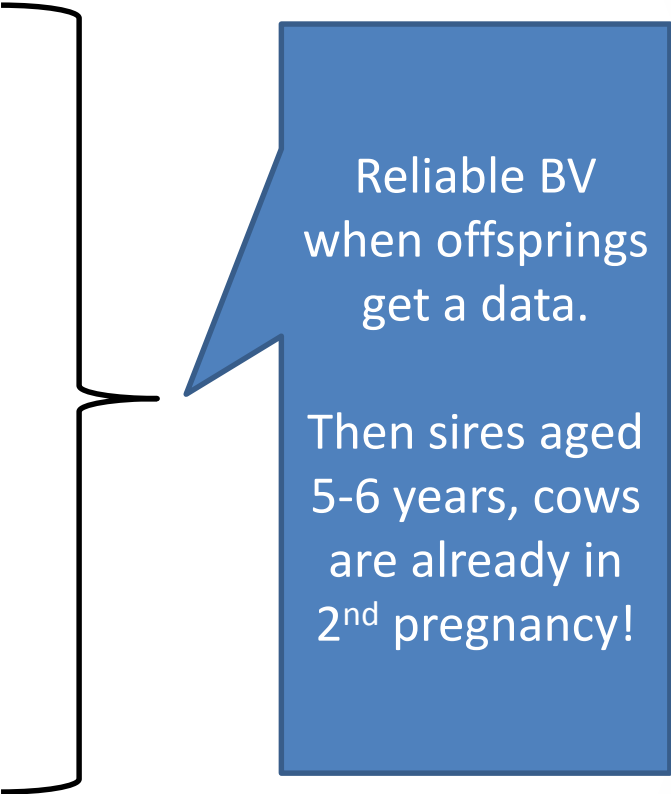
SELECTION – HOW IT'S WORKS?

Selection criteria - tool



How to get Breeding Value?

- Data (milk yield, fat content, SSC, WH,...)
- Pedigree
- Statistical model with several effects
- Methods:
 - BLUP animal model
 - Random regression AM
 - ...



Reliable BV
when offsprings
get a data.

Then sires aged
5-6 years, cows
are already in
2nd pregnancy!

Genetic gain

Heritability and variance are in the given time constant!

We can influence only ,i' & ,l'

Genetic change

$$\Delta G = \frac{\boxed{i} \boxed{h^2} \boxed{\sigma_p}}{\boxed{l}}$$

Selection intensity
Heritability
Variability
Generation interval

Progeny test – 6 years
Genomic sel. – 2 years
with ET = for ♀

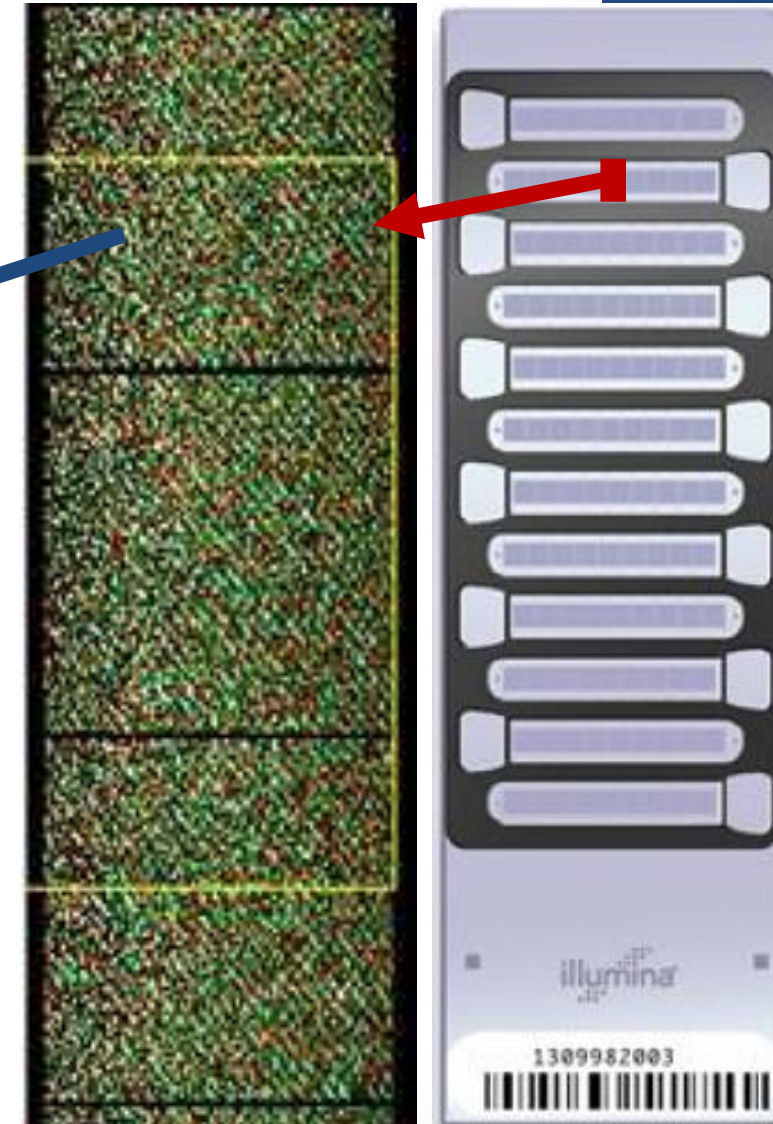
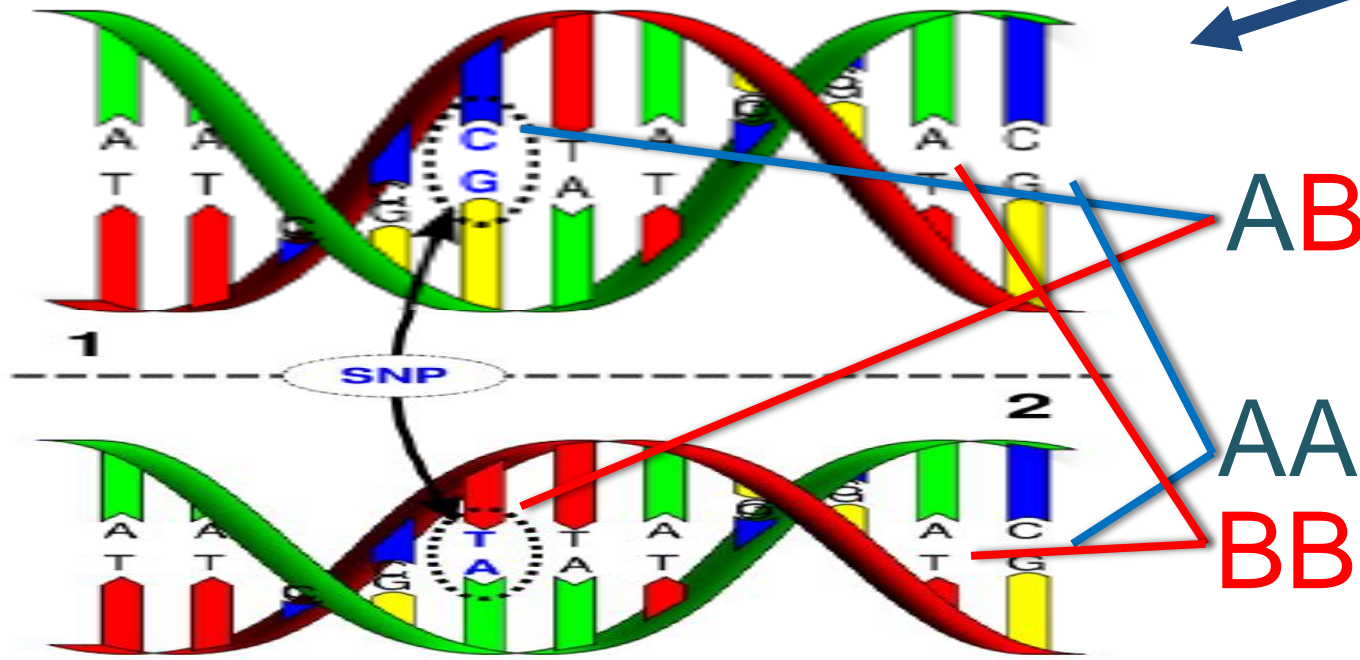
% selection	i
1	2.67
5	2.06
10	1.75
30	1.16
50	0.80
70	0.50
90	0.19
100	0

Population size
DEU 4 mio
USA 9 mio
SLO 0,1 mio

GENOMIC SELECTION

BV after birth or already before - GS

- Basic principle of GS:
 - Classic BV and
 - Genome informations (SNP-chip) for animals with reliable BV



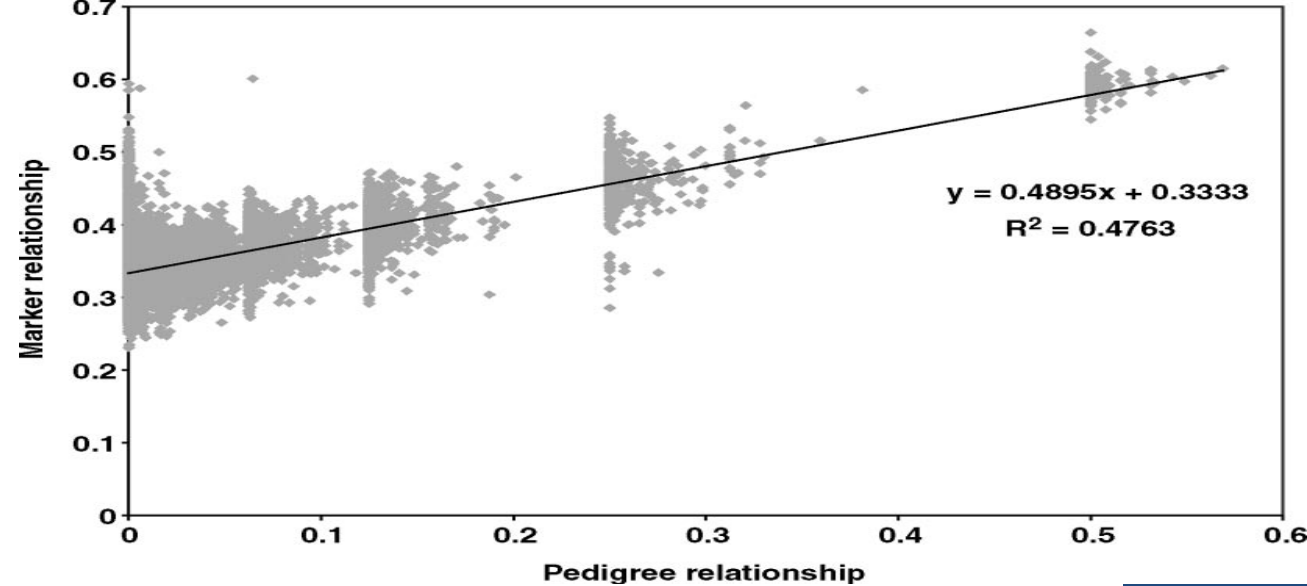
Genomic selection

- Advantages:

- Shorter generation interval
- Use of animals at sexual maturity
- Greater efficiency in the selection of the traits with low heritability
- Tool to prevent inbreeding - functional inbreeding
- Genetic disorders prevention

- Limitations

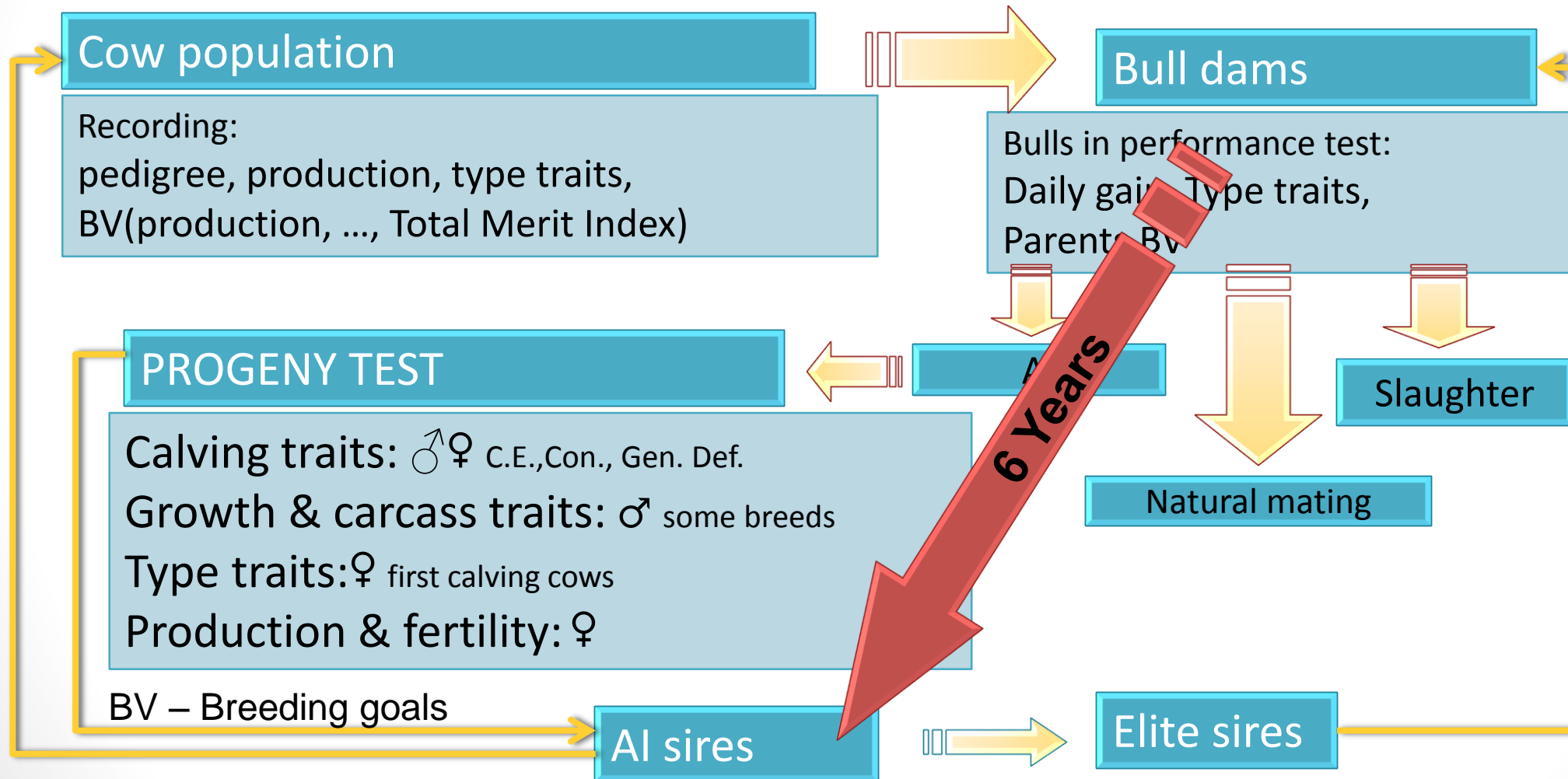
- A large number of animals in the base population (BV + SNP)
- Great investment?!?



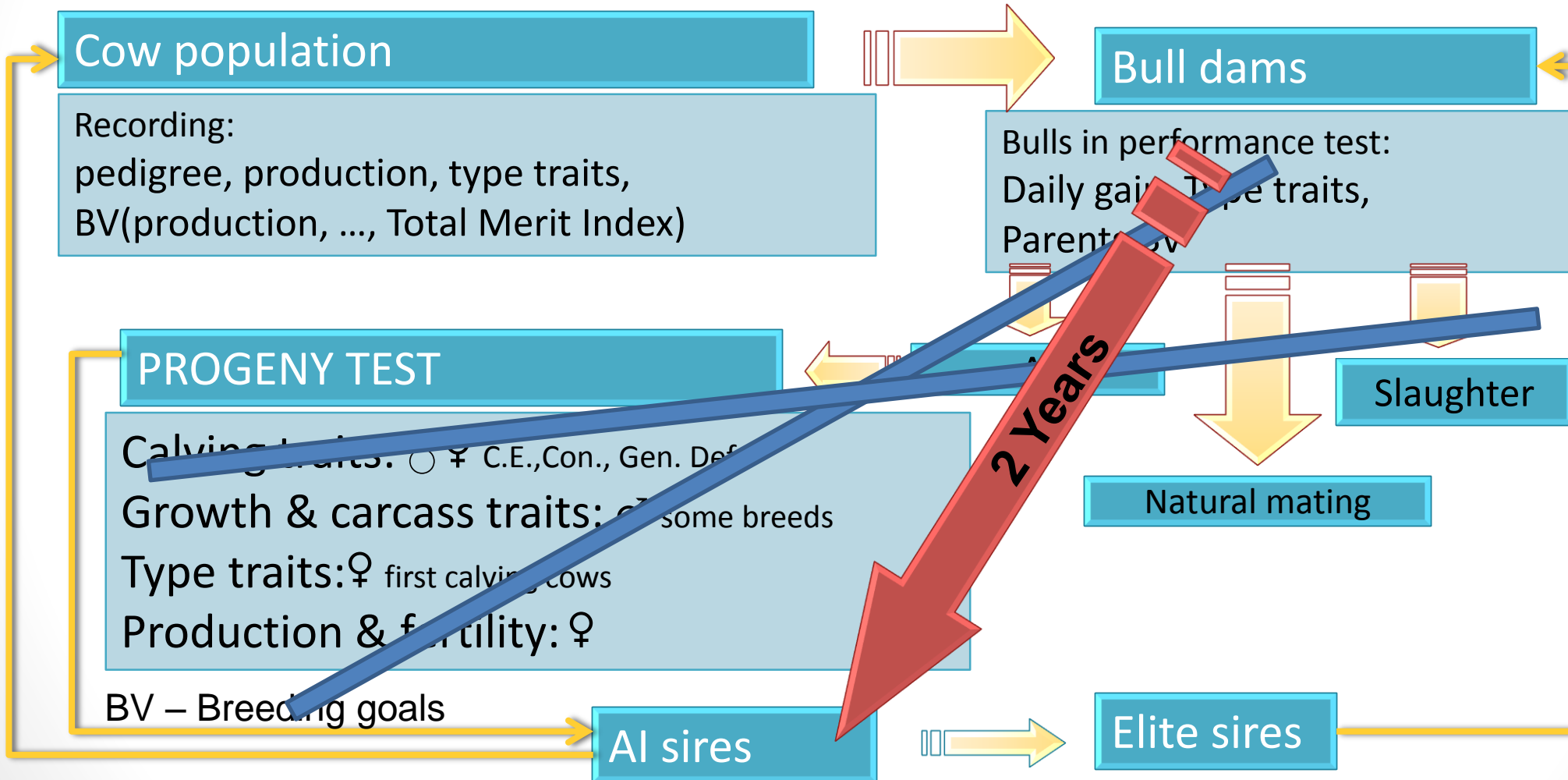
Hayes in Goddard (2008)

<http://jas.fass.org/cgi/content/full/86/9/2089>

Selection Program scheme –classic PT



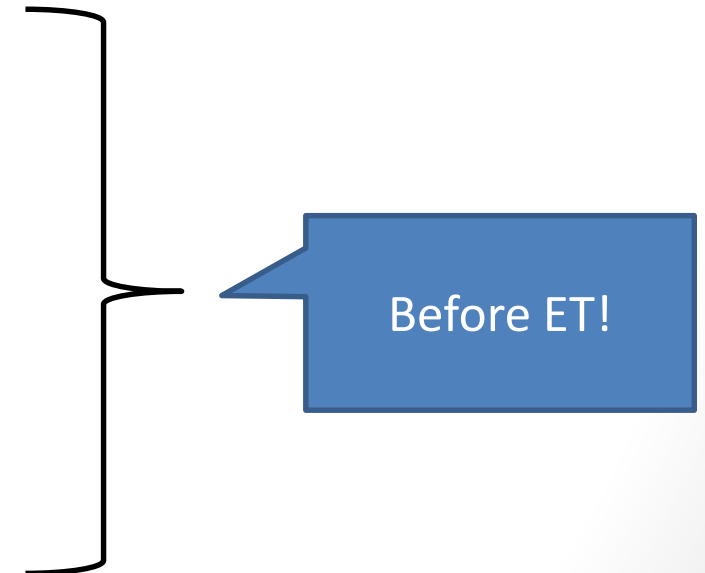
Selection Program scheme - GS



Good example

Genomic selection – FRA-13

- AI centre → Genomic centre
 - Beside bulls - semen, heifers - ET
 - Fair play with breeders – minimising of speculations
- Embryo genomic selection
- Known sex
- Estimates of genetic disorders
- GEBV
- Functional inbreeding



Facts of our populations

- Very small in Europe – practically nothing (herd) in the World
- Competing on market with raw milk
- ‚Same‘ breeding program
- Breeding programmes prepared for intensive production with high management level
- Variable management level in praxis
- Pasture – grass land vs. crop production

Niche selection – product quality!

ANOTHER POSSIBILITIES?

Product quality - traits

- A 30 - curd firmness
- Beta – lactoglobulin
- Kappa casein
- Beta casein
- MIRS (Mid-InfraRed Spectroscopy)
 - FA ω -3 : ω -6 = 1 : 2-3 – pasture/cereals

Kappa casein

- Allelic forms: B, A, E,...
- BSW just A & B
- Key factor for milk coagulation properties → impact on cheese yield
- Comparison of genotype AA : BB
 - cca. 25 % rennet coagulation time
 - cca. 50% lower curd strength
 - cca. 10% lower cheese yield
 - Ex. $6000 \text{ l/lac} \times 5 \text{ lac} = 30000 \text{ l} \approx 3000 \text{ kg of cheese}$
 - Difference cca. 7 % = $210 \text{ kg of cheese} \times 5\text{€} = 1000 \text{ €}$
 - + higher breeding animals price
 - + selection on calves

Kappa casein – CHE 2012

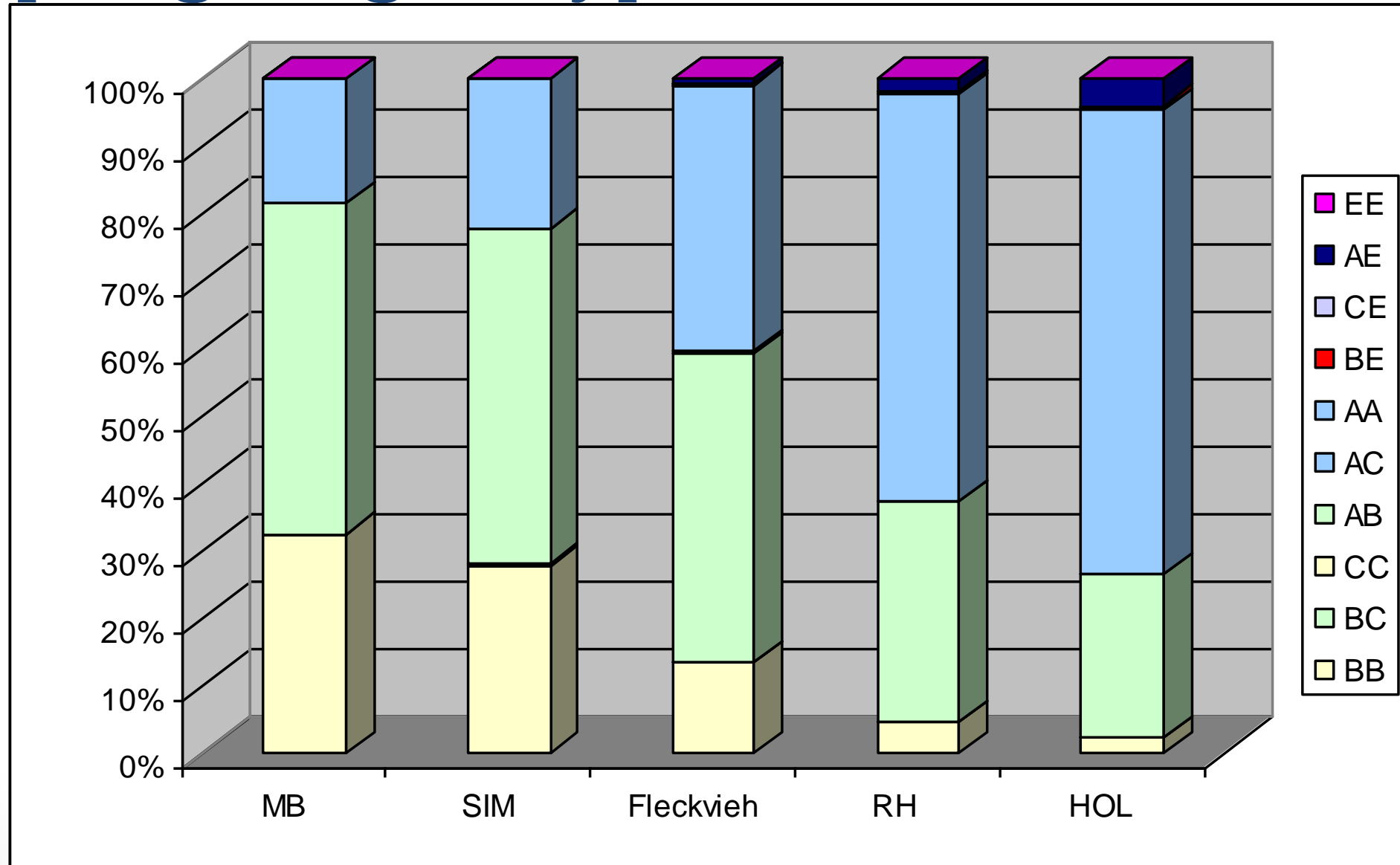
- Sires KK - AE
 - Picstone SHOTTLE-ET GB 598172
 - Sandy – Valley BOLTON-ET US 131823833

Each second daughter hold
E alel!!!

KK genotype AI sires in CHE 2012

Rasse	Anzahl	Häufigkeit der Kappa-Kaseinvarianten			
		A	B	C	E
Normande	14	25.0%	75.0%	0.0%	0.0%
Montbéliarde	57	43.0%	57.0%	0.0%	0.0%
Simmental	174	47.1%	52.6%	0.3%	0.0%
Swiss Fleckvieh	189	62.7%	36.5%	0.3%	0.5%
Red Holstein	364	77.6%	21.2%	0.0%	1.2%
Holstein	275	82.9%	14.7%	0.0%	2.4%

Offspring KK genotypes ♂=♀



Beta casein

- Alleles variant A1 in A2. Mutation A2 to A1.

Comparative evaluation of cow β -casein variants (A1/A2) consumption on Th₂-mediated inflammatory response in mouse gut

Mohammad Raies Ul Haq · Rajeev Kapila · Rohit Sharma · Vamshi Saliganti · Suman Kapila

Analysis of Slovak Spotted breed for bovine beta casein variant as risk factor for human health*

Martina Miluchová[✉], Michal Gábor and Anna Trakovická

- Allele A1 associated with several diseases

beta-casomorphin-7 (BCM 7)!

Protein chain showing amino acids in A1 and A2 beta-casein

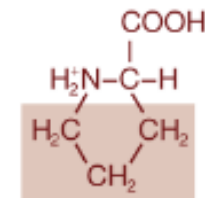
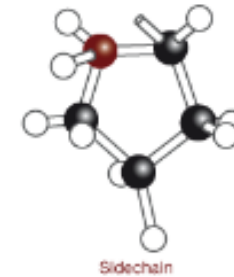


One amino acid difference at position 67 in the protein chain

Cow's Milk Allergenicity

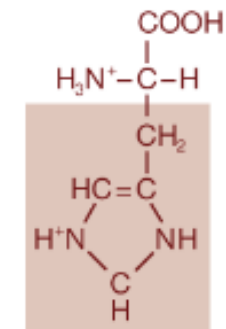
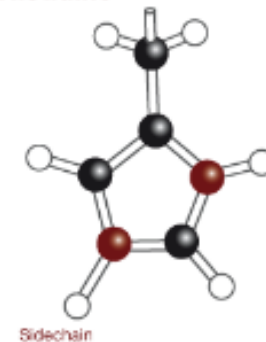
Sophia Ts

Proline



Nonpolar (hydrophobic)

Histidine



Basic

Beta casein

- Differences between breeds
 - HOL 50-50
 - GUE < 10% A1
 - BSW ~ 25%
 - SIM ???
 - Old breeds ???
- Beta-casomorphin 7 (BCM-7) yielded during digestion of A1

Etiology:

type 1 diabetes,
cardiovascular disease,
neurological disorders such as autism and schizophrenia

Selection on caseins – economic impact

- Dependent - level of interest
 - National - International
 - Dairies
 - Breeder, own milk processing or/and direct selling of milk
- Fresh milk selling A2
 - Market establishment
 - Networking - connecting!
 - Risk by low investment
- Milk processing, option connection with A2
 - An immediate result - a small investment
 - Division of cows, where part of milk is sold
 - Cooperation - Exchange of animals
- Long-term sales of breeding animals

Niche selection – product quality!

SOME EXAMPLES?

CHE- SIM

Mitteilungen

swissherdbook bulletin | nummer 6/2012

Kappa-Kasein E – eine nicht käseereitaugliche Milchproteinvariante

Gewisse Holsteinstiere vererben mit dem Kappa-Kasein E eine Milchproteinvariante, welche zu schlechter Milchgerinnung führt und die Käseherstellung beeinträchtigen kann. Produzenten von Käseemilch wird empfohlen, bei der Auswahl der Stiere auf den Kappa-Kasein-Genotyp zu achten.

Die Käseherstellung beginnt mit dem so genannten „Dicklegen“ der Milch. Dabei wird das mengenmässig wichtigste Milchprotein, das Kasein, so verändert, dass es eine elastische Gallerte bildet. Es ist wichtig, dass die Labgallerte eine genügende Festigkeit entwickelt. Schlecht gerinnende Milch führt zu deutlich geringeren Käseausbeuten, aber auch die Käsequalität kann leiden.

Einfluss der Genetik

genau in der Mitte. In den Hartkäsegebieten Norditaliens begann man vor 30 Jahren, das Kappa-Kasein B in der Milchviehzucht zu fördern.

Nachteiliger als Kappa-Kasein A

Wenig bekannt ist, dass es mit der genetischen Variante E eine weitere genetische Variante des Kappa-Kaseins gibt, die für die Labgerinnung der Milch noch nachteiliger ist als das Kappa-Kasein A. Dies ergaben Studien aus Deutschland, der Schweiz, Finnland, Italien und Estland¹. Exemplarisch sei dies anhand einer Grafik gezeigt (siehe **Abb. 1**), die auf den Daten einer finnischen Studie basiert.

Die geringe Festigkeit der Labgallerte macht die Milch von Kühen des Kappa-Kasein Genotyps AE oder EE



Schneiden der Milchgallerte mit der Käseharfe

(Foto: ALP)

Mitteilungen

swissherdbook bulletin | nummer 6/2012

Träger der Kappa-Kaseinvariante E

Der Kappa-Kasein-Genotyp wird für Schweizer KB-Stiere seit vielen Jahren untersucht und ausgewiesen. Daher sind bei Schweizer KB-Stieren die Kappa-Kaseinvarianten weitgehend lückenlos vorhanden.

Hingegen werden bei Jungstieren und ausländischen Stieren die Genotypen noch nicht systematisch bestimmt. Man ist aber bestrebt, in Zukunft die Genotypen aller KB-Stiere auszuweisen. Ausserdem ist es möglich, dass sich unter den Stieren des Genotyps AA und AB noch falsch identifizierte Träger des Kappa-Kaseins E befinden, weil zum Teil noch mit Methoden typisiert wurde, die keine Unterscheidung der Varianten A und E erlaubten.

Grosse Rassenunterschiede



Töchter von MARCO-ET mit Genotyp Kappa-Kasein BE sind je zur Hälfte Trägerinnen der günstigen Kappa-Kaseinvariante B und der ungünstigen Kappa-Kaseinvariante E.
Foto: Nachzuchtgruppe von MARCO-ET CH 120.0546.7893.1 RH

ITA - HOL

INSEME

INVESTIRE IN GENETICA È PER SEMPRE

Aprile 2015

Aksel

Alli. Denti Aksel E93

127 FIGLIE

BETA CASEINA A2A2

IT0199902442 - aAa 216345

Allevamento: AZ. Danti Agostino, Dentini, Sarnbrassato Marina e Governina S.B. - CR

FOEMINA

ROBOT MILK

FORTE MIGLIORAMENTO PRODUTTIVO CON L'ENTRATA DELLE 52 SECONDPARE!

MAMMELLE OTTIME +3.29

PRODUZIONE		VALUTAZIONE LINEARE	
GPTT	+ 2011	Statura	3,58
Latte	+ 797	Forza - Vigore	1,49
Grasso	+ 0,07 kg + 36	Profondità	1,21
Proteine	+ 0,01 kg + 27	Angiosità	2,74
K Caseina	AA	Gruppo ang.	1,04
Figlie	127	Gruppo largh.	3,29
Allevamenti	93	Conformazione	3,08
Attendibilità	93%	Arti di lato	0,27
MORFOLOGIA		Arti dietro	2,68
Tipi	+ 2,88 Figlie 98	Piede ang.	3,12
ICM	+ 3,29 Allev. 74	Locomozione	3,27
IAP	+ 3,09 Allev. 80%	Attacco ant.	4,12
GESTIONALE PARTI 1277		Attacco post. all.	3,47
Parto	100 att. 97%	Attacco post. largh.	2,23
Parto figlio	107 att. 60%	Legamento	3,08
Mungibilità	107 att. 80%	Prof. mammella	3,60
Cell. somatiche	105 att. 89%	Pos. capezzoli ant.	1,07
Longevità	111 att. 70%	Pos. capezzoli post.	0,66
Fertilità figlie	97 att. 81%	Capezzoli dim.	-0,17
ITC	101 att. 89%		

Accoppiamenti consigliati:
Linea O-Max: Ota, Ita, Garret, Rogart, Branco, Rosa, Eight, Legend, Colombiano, End-Story, Miss, American, Aschman.
Linea BW Marshall: Toystry, Wilkman, Buckeye, Zandy, Lou, Marmax.
Linea Goldwyn: Arto, Paloma, Jordan, Lashberry, Fower, ed inoltre: Fibrax, Planet, Active, Prince, Tardis, Leccio.

Kappa Caseina e Beta Lattoglobulina

Nella scelta dei tori da utilizzare, tenere in attenta considerazione la **k-caseina** e la **beta-lattoglobulina** è dunque strategico per tutti gli allevatori che desiderano il loro latte, o anche solo una parte, alla trasformazione casearia in qualsiasi tipo di formaggio.

L'EFFETTO SULLA QUANTITÀ DI FORMAGGIO PRODOTTO

I numerosi studi scientifici, condotti da ricercatori italiani che studiano, hanno evidenziato un effetto molto significativo di queste varianti genetiche sulla quantità e la qualità della caseina, effetto che si traduce in una maggiore resa per tutti i tipi di formaggio in quanto vengono a determinarsi le condizioni chimico-fisiche ideali per la formazione del coagulo.

In Italia 1 e 2 si riferiscono, dai risultati della letteratura sulla resa ottenuta su latte con k-caseina AA o BB nel caso di prove di identificazione di Parmigiano Reggiano ed in formaggio di media stagionatura.

Il genotipo della k-caseina influenza la resa in misura diretta a seconda del processo di caseificazione, ma la differenza fra il latte di tipo AA o BB è significativa per tutti i formaggi, perché significativo è il suo effetto sulla qualità casearia del latte.

KAPPA CASEINA

PARMIGIANO REGGIANO			
GENOTIPO	RESA (%)	SU 1000 L	SU UNA LATTAZIONE di 100 q.li
AA	6,47	64,7 kg	6,470 kg
BB	7,07	70,7 kg	7,070 kg
DIFFERENZA (BB-AA)	+0,60	+6 kg	+600 kg

FORMAGGI DI MEDIA STAGIONATURA			
GENOTIPO	RESA (%)	SU 1000 L	SU UNA LATTAZIONE di 100 q.li
AA	9,23	92,3 kg	9,230 kg
BB	10,05	100,5 kg	10,050 kg
DIFFERENZA (BB-AA)	+0,82	+8,2 kg	+820 kg

La **k-caseina** costituisce circa il 72% della caseina del latte. Le varianti genetiche più comuni nella razza Frisone sono la A e la B. Gli studi effettuati confermano la loro importanza nel latte di soggetti AA e BB, mostrando una differenza di oltre il 3% sulla percentuale di caseina tra i soggetti AA e i soggetti BB, anche in presenza dell'allele B. La **beta-lattoglobulina** è presente in un numero di copie inferiore a quello della **k-caseina**, ma la sua stessa **k-caseina** che agisce il coagulo. Questo differenzia lo si sottolinea ancora una volta, **influisce sulla resa casearia del latte, quindi su traggo beneficio tutti i tipi di caseificazione**. Le prove di caseificazione con latte AA e latte BB mostrano una maggiore resa del latte k-caseina BB in diversi formaggi. Più precisamente per 1.000 kg di latte si ottiene, nel latte k-caseina BB, rispetto al latte AA, una maggiore resa corrispondente a 8 e in più di Parmigiano Reggiano. La selezione per un aumentato contenuto di proteina nel latte, anche nella razza Frisone ha reso disponibili in numero sempre più elevato di riproduttori portatori del gene B. Questo rende più facile per gli allevatori migrare la frequenza dell'allele B della **k-caseina** propria mandria.

BETA LATTOGLOBULINA

La **beta-lattoglobulina** costituisce la maggiore frazione delle albumine, che a loro volta costituiscono circa il 70% delle proteine del siero, così che rimane del latte dopo il processo di caseificazione. Nella Frisone sono presenti due varianti principali: la A e la B. Gli studi scientifici mostrano un'importanza positiva sulla resa delle varianti B della **beta-lattoglobulina**, comparando, per esempio a circa 2 kg di Parmigiano Reggiano in più ogni 1.000 L di latte lavorato. Questo prevede quantità di caseina che agisce il coagulo. Questo differenzia lo si sottolinea ancora una volta, **influisce sulla resa casearia del latte, quindi su traggo beneficio tutti i tipi di caseificazione**. Le prove di caseificazione con latte AA e latte BB mostrano una maggiore resa del latte k-caseina BB in diversi formaggi. Più precisamente per 1.000 kg di latte si ottiene, nel latte k-caseina BB, rispetto al latte AA, una maggiore resa corrispondente a 8 e in più di Parmigiano Reggiano. La selezione per un aumentato contenuto di proteina nel latte, anche nella razza Frisone ha reso disponibili in numero sempre più elevato di riproduttori portatori del gene B. Questo rende più facile per gli allevatori migrare la frequenza dell'allele B della **k-caseina** propria mandria.

LA TRASMISSIONE GENETICA

Utilizzare un toro BB per un accoppiamento si può tradurre in un 100% di figli BB se la vacca è anch'essa di genotipo BB. In un 100% di figli BB se la madre è di genotipo AA e in un 50% di figli BB e un 50% di figli AB nel caso di una madre con genotipo AB. L'utilizzazione di un toro AB darà 50% di BB e 50% di AB nel caso di madre BB, in un 50% di soggetti AB se la madre è AA ed in un 25% di soggetti BB e 50% di soggetti AB se utilizzata su una vacca AB.

Gli stessi principi valgono per le varianti AA e AZ della **beta caseina** e per le varianti A e B della **beta lattoglobulina**.

NOME TORO	CROSS	K-CASEINA	BETA-LATTOGLOBULINA	I.T.C.
LDITY	Ab-In x Goldwyn	BB	BB	116
ECCO	Massey x Marfold	BB	BB	112
BARBARESCO	Epic x Freddi	BB	BB	111
LEKKER	Control x Mac	BB	AA	111
MICHIGAN	Cashmoney x Gerard	BB	AA	109
INTENSITY	Eaden x Planet	BB	AA	109
EJECT	Million x Titanic	BB	AA	101
GLAUCO	Duplex x Allen	AB	BB	108
COLOMBIANO	O-Man x Aaron	AB	BB	104

Ringraziamenti

Si ringrazia il prof. Sumner dell'Università di Parma per i contributi biologici che hanno costituito la base necessaria per queste note informative.

Ecco

Cristallo Insieme Secco

IT019991076247

Allevato da AZ. Gianfranco Dorantini - Cremona

ALTO ITC 112

VACCHE MOLTO FUNZIONALI

ROBOT MILK

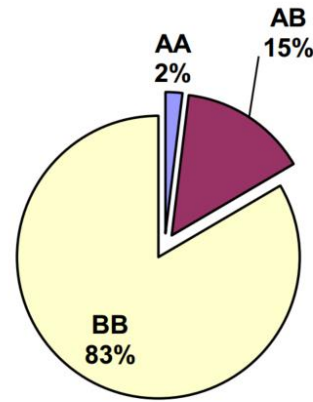
Accoppiamenti consigliati:
Linea Goldwyn: Arto, Wayne, Almar, Golden Dream, Scatelli, Goldstone, Sego, Palermo, Jordan, Lashberry, Abocci, Fover, **Linea Shetler:** Beryll, Bruck, Feroce, Sego, Superior, Doberman, Sevan, Al, Truro, Shet, Tigge, H8, Sarraz, **Linea Planet:** Oronov, Bockers, Sharnock, Harco, Mulgan, D'Isoreo, Vektor, Egoyle, L. Moulton, Doornay, **Linea Boffas:** Maccasale, Miroc, Dany, Mogi, Gimpic, **Linea SuperMilk:** Epic, Indico, Superior, Superman, Superstar, Sunay, **Linea Niagra:** Vagot, Oak.

Caratteristiche
 Il primo figlio di Massey in prova per il brand insieme. È anche il primo figlio in IA per questa nuova, interessante famiglia dell'allevamento DORANTINI. La madre di Ecco ha chiuso da poco una straordinaria prova stagionale, la migliore di sempre nella storia di questo allevamento: gli è parsi nella produzione. Eccellente fra un alto indice genetico ed il la vacca numero 25 in Italia per GPTT. Ecco è stata la prima vacca di razza Friesian a superare il record di Longevità. Il suo latte è stato premiato come "Best of Breed" e "Best of Show" in due occasioni nelle classifiche per il genotipo BB per

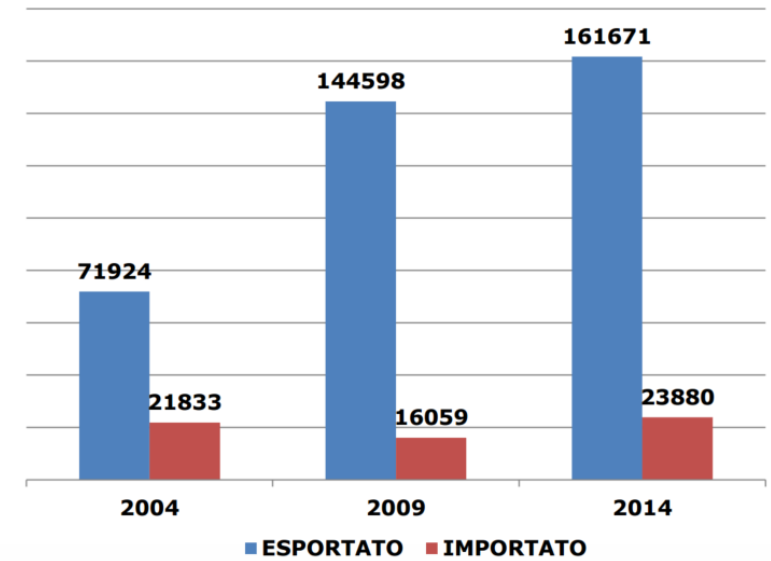
PRODUZIONE		VALUTAZIONE LINEARE	
GPTT	+ 2010	Statura	0,81
Latte	+ 718	Forza - Vigore	0,86
Grasso	+ 0,13 kg + 50	Profondità	0,39
Proteine	+ 0,17 kg + 42	Angiosità	0,34
K Caseina	BB	Gruppo ang.	-1,80
Figlie	0	Gruppo largh.	1,31
Allevamenti	0	Conformazione	0,43
Attendibilità	75%	Arti di lato	-0,16
MORFOLOGIA		Arti dietro	3,18
Tipi	+ 1,51 Figlie 0	Piede ang.	1,47
ICM	+ 1,96 Allev. 0	Locomozione	1,42
IAP	+ 3,94 Allev. 80%	Attacco ant.	2,63
GESTIONALE PARTI 0		Attacco post. all.	0,93
Parto	87 att. 60%	Attacco post. largh.	1,70
Parto figlio	113 att. 33%	Legamento	1,83
Mungibilità	113 att. 33%	Prof. mammella	3,30
Cell. somatiche	106 att. 73%	Pos. capezzoli ant.	1,14
Longevità	114 att. 80%	Pos. capezzoli post.	-0,18
Fertilità figlie	108 att. 60%	Capezzoli dim.	-1,80
ITC	113 att. 74%		

ITA - BSW

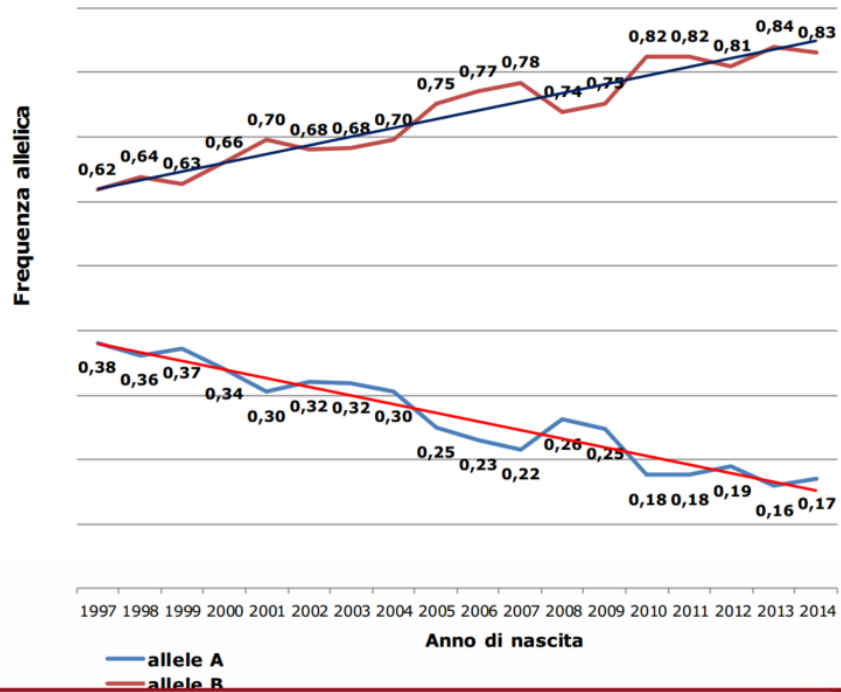
NUMERO SOGGETTI VIVENTI CON TEST K-CASEINA 23.312 FREQUENZA ALLELE B OLTRE 90%



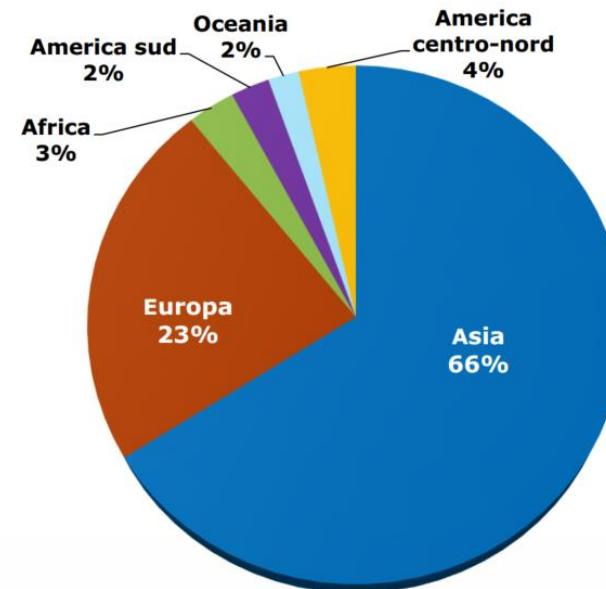
MATERIALE SEMINALE ESPORTATO E IMPORTATO



FREQUENZA K-CASEINA PER ANNO DI NASCITA



AREE D'ESPORTAZIONE DEL MATERIALE SEMINALE



Welcome to

The
a2 Milk
Company™

2013/14
Annual Report

The a2 Milk Company™



Our history

2013-2014

2013-2014

2014

Company name and subsidiary names become aligned to one new brand identity: The a2 Milk Company™

a2 Milk™ UHT is launched into China

We take full ownership of the UK joint venture from Müller Wiseman, and UK business momentum continues

a2 Milk™ in Australia extends into thickened cream, and continues to drive strong market share growth in the fresh milk supermarket category

First human digestion trial published in European Journal of Clinical Nutrition reporting a digestive difference between A1 and A2 beta casein protein and supporting previous studies

2013

a2Platinum® Infant Formula is launched across China, Australia and New Zealand and total Infant Formula business gaining momentum

2012

Successfully completed capital raising and transferred listing to the NZX Main Board

Strong NZ institutional investor support

Formed a manufacturing agreement with Synlait Milk for the exclusive manufacturing of a2Platinum® nutritional powders and infant formula in New Zealand

China State Farm is appointed as sole distributor for a2Platinum® infant formula into China

Commissioned a new, state-of-the-art milk processing facility in Sydney, Australia

2011

Entered a joint venture with Robert Wiseman Dairies to manufacture and market a2 Milk™ in the UK and Ireland

The company records a profit of NZ\$2.1m

2010

Full ownership of the Australian joint venture is purchased and Geoff Babidge is appointed Managing Director and CEO

2008

Strong support from first NZ institutional investor AMP

Major change in company strategic direction shifting from a licensing model to a branded product model. Consequently exiting license agreements in Korea and later the US

Consumer and healthcare professional advocacy in Australia starts driving considerable brand growth

2007

Entered a joint venture with Freedom Foods to produce and market a2 Milk™ in Australia

2004

Listed on the NZX – Alternative Market (NZAX)

2003

a2 Milk™ begins selling in Australia and New Zealand via licensees

2000

Our company is founded by Dr. Corran McLachlan and Howard Paterson, armed with unique intellectual property and growing belief of the effect different milk proteins have on human health

Dates provided above are for the full calendar year.

Our history

Continuing operations

	Notes	2014 \$'000	2013 \$'000
Sales		110,621	94,304
Cost of sales		(70,802)	(60,671)

Golden Guernsey Goodness



Golden Guernsey Milk Contains:

- 95% A2 Protein
- More Beta Carotene
- Higher B1 & B12
- Lower Cholesterol
- Higher Naturally Occurring Vitamin D
- Higher Vitamin A



Since the Guernsey breed was developed by French monks on the Island of Guernsey in the English Channel, these beautiful cows have been known far and wide for the superior quality of the milk they produce. Golden Guernsey milk was the premium drinking milk in the good old days, when local milk was delivered right to your door.

The Golden Guernsey logo signifies that the dairy products you are consuming have been produced using 100% Golden milk from Guernsey cows. The added beta carotene gives the milk its namesake golden color, makes Golden Guernsey butter remarkably and naturally brilliantly yellow and lends a golden hue to other products manufactured using Golden Guernsey milk.



www.usguernsey.com/gg.htm

Guernsey Milk - Full of A2 Goodness

search...

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- ▶ Home
- ▶ UK Suppliers of Guernsey milk products
- ▶ FAQ
- ▶ Web Links
- ▶ News Feeds
- ▶ Testimonials
- ▶ "Guernsey Champions"
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What a colourful & creamy collection!



Home Overview Objectives Partners SFPs News Publications Winter/Summer2015 RESTRICTED AREA

Next generation European system for cattle improvement and management

"Research for the benefit of SMEs" from the 7th Framework Program



Gene2Farm objectives

The Gene2Farm project will address the needs of the cattle industry, in particular the SMEs and end users needs for an accessible, robust, adaptable and reliable system to apply the new knowledge of the bovine genome to genetic improvement in cattle, to underpin sustainability and profitability of European cattle farming.

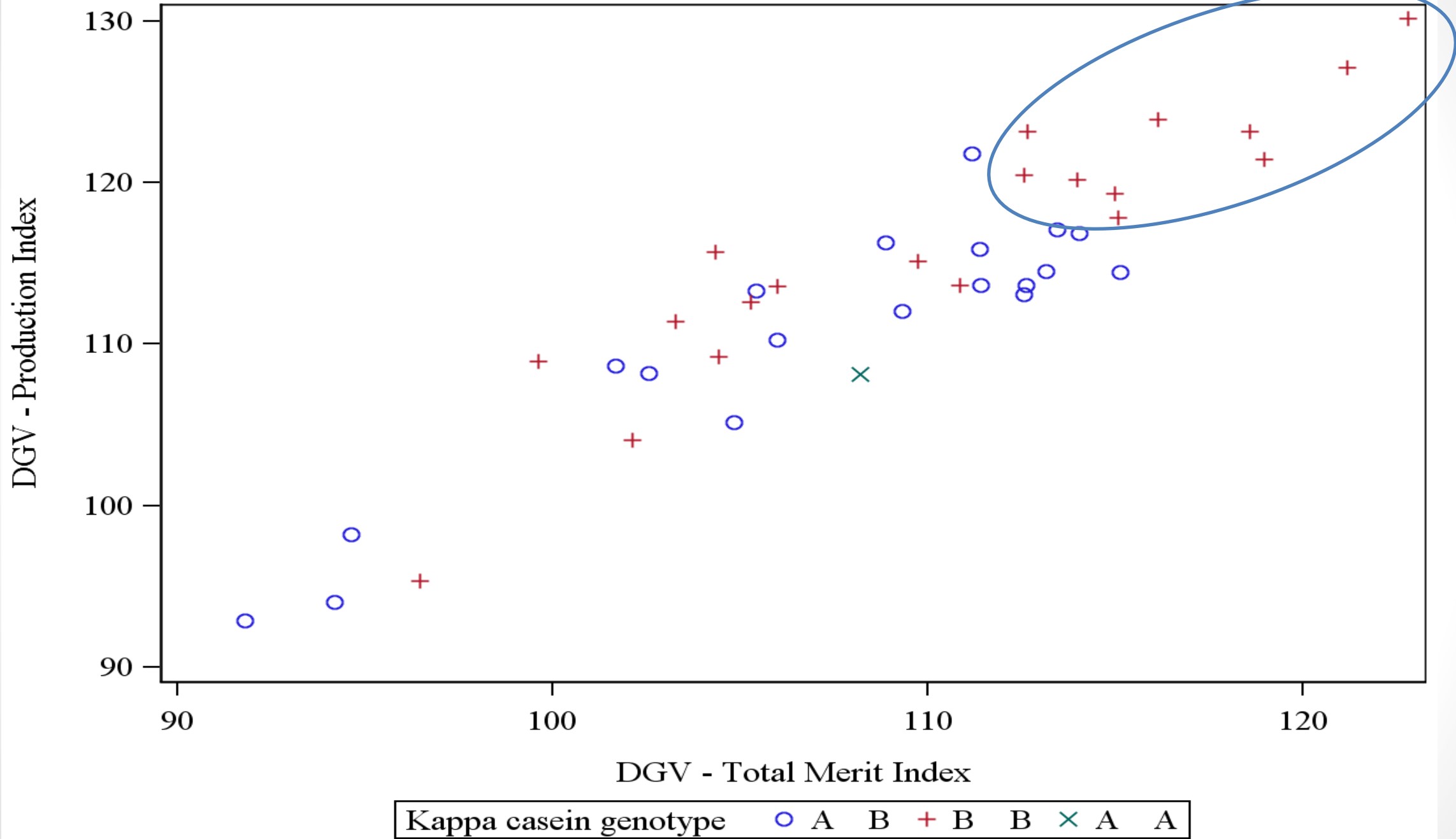
The project general objectives are:

- to derive complete genome information to understand genome structure and to design high and low density genotyping panels.
- to develop the tools to impute higher density genome information from lower density genotype data and to make exchange information easier.
- to address the needs for measuring a wider range of biological variables underlying important commercial traits, in order to provide data on additional important traits for use in selection.
- to develop appropriate statistical models and applications for using the genomic and phenotypic information in order to optimise and customise genetic selection strategies.
- to disseminate the information to the SMEs, the wider cattle breeding industry and to end users.

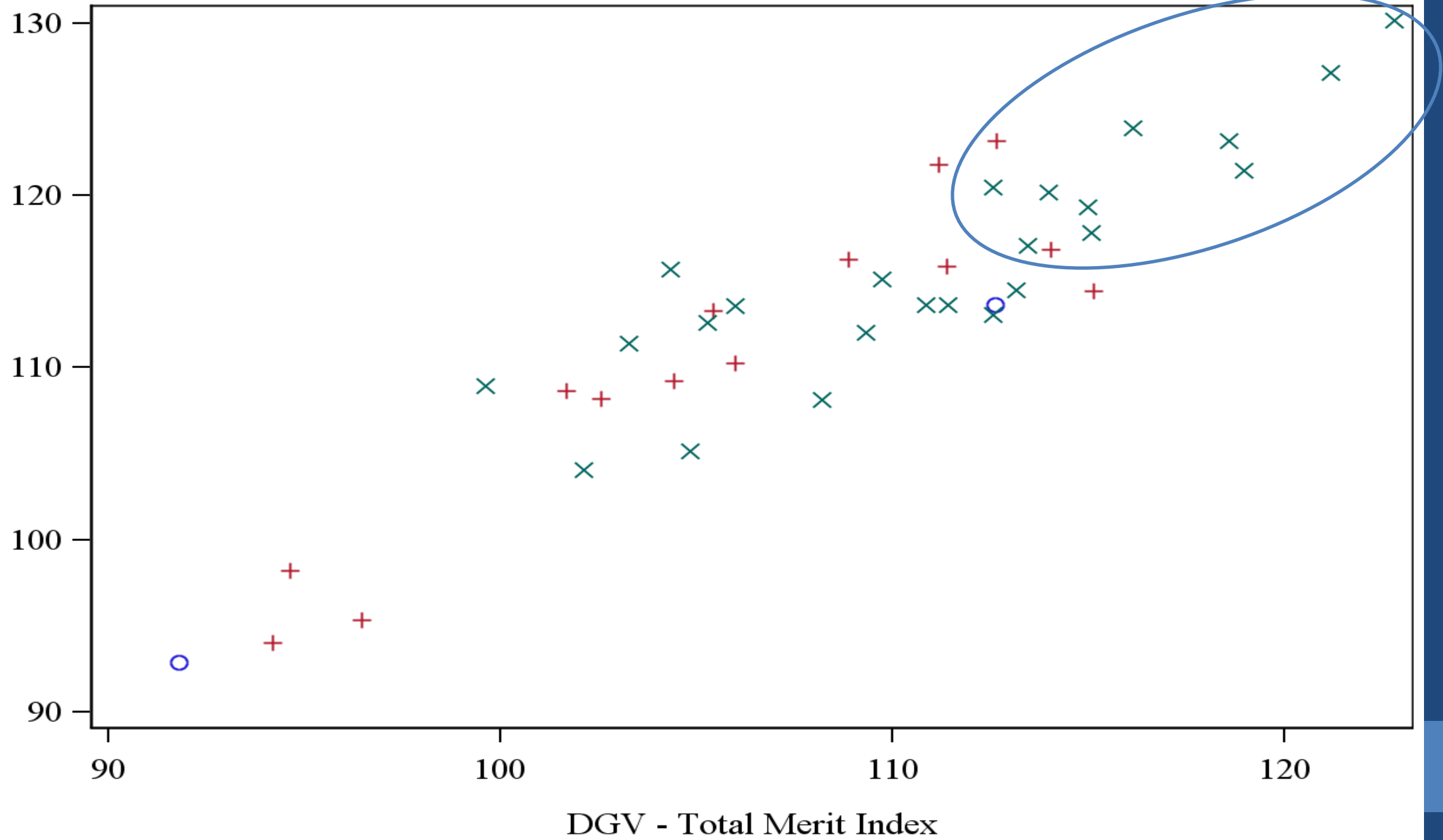
CASE STUDY -SLOVENIA BSW

40 animals - GS

Kappa casein genotype	Beta casein genotype			
	A1A1	A1A2	A2A2	Total
AA	0	0	1	1
AB	2	11	6	19
BB	0	3	17	20
Total	2	14	24	40

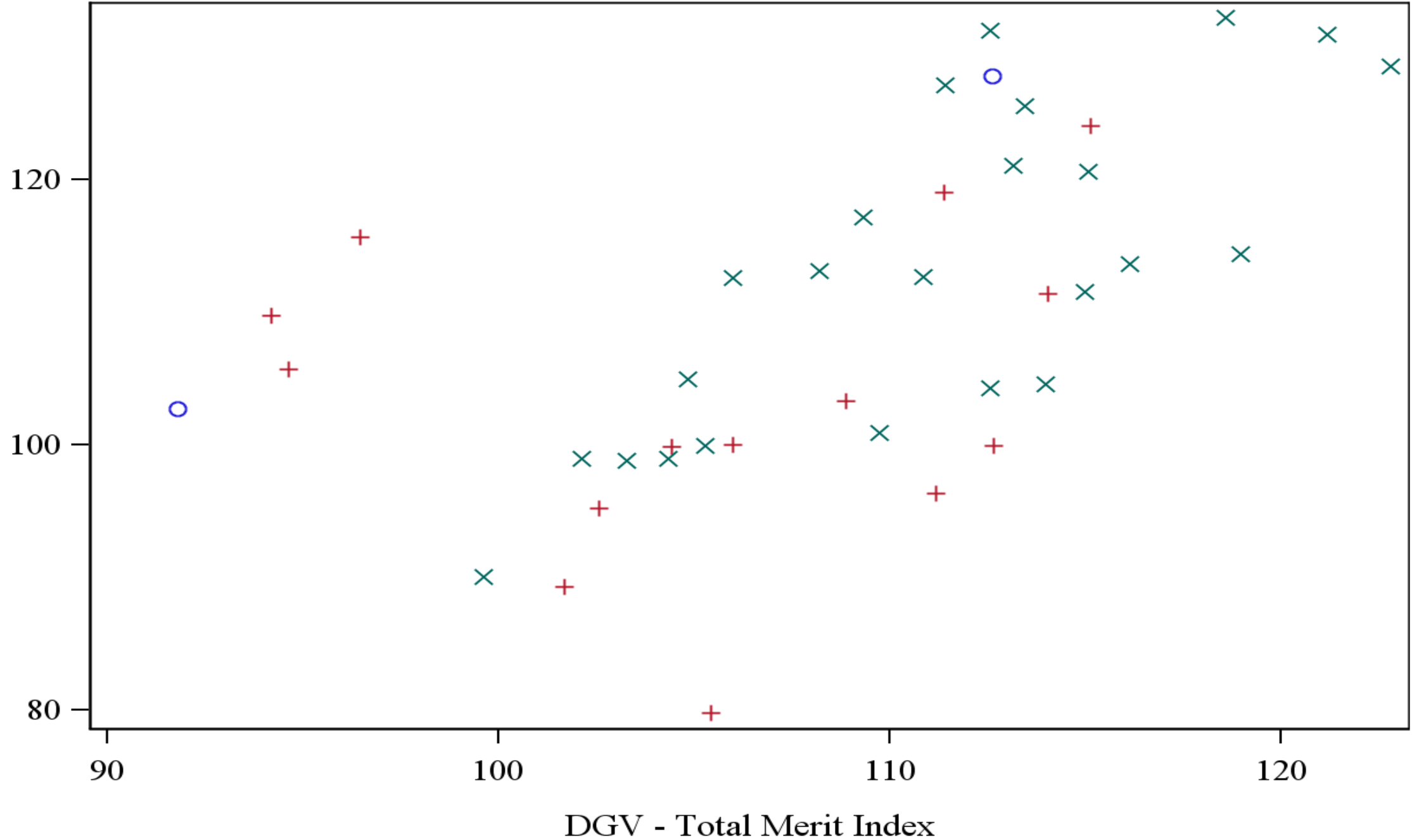


DGV - Production Index



Beta casein genotype ○ A1 A1 + A1 A2 × A2 A2

DGV - Longevity



Beta casein genotype ○ A1 A1 + A1 A2 × A2 A2

Conclusions

- Competition with large populations is irrational
- The first results of the GB BSW show that the selection of the products quality is possible
- Possible strategies
 - Keep the level of production and at the same time fixing the desired allele
 - Selection for the production on pasture - forages
- Networking
 - Breeders
 - Regions with similar conditions of production
 - National
 - International

The potential advantages of niche selection

- Direct effects
 - Higher products quality
 - Better economy (on farm and national)
 - The possibility of selling special genetic material
- Indirect effects
 - Jobs
 - Preserved landscape
 - More attractive for tourism
 - ...
- More options is possible!!

THANK YOU FOR YOUR
ATTENTION!