

Global Evaluation for Herefords

A feasibility Study for World Hereford Council

Some Results

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Overview

- Objectives
- Approach
- Linkage database
- Some Results
- Conclusions
- Next steps

Objectives

- Evaluate if global beef cattle evaluation for Herefords is feasible
 - Global = 10 countries who provided data for this study
 - USA *
 - Argentina *
 - Sweden
 - South Africa
 - New Zealand *
 - Canada *
 - Uruguay *
 - United Kingdom *
 - Ireland
 - Australia * * same data format

Approach

- Accumulate **pre-adjusted phenotypic** data from participating countries
 - Data on 6.65 million animals

Records by country

	Aus	NZ	US	CAN	URU	ARG	UK*	SA	SWE
BW	276,492	114,625	2,024,619	464,316	58,399	29,544	18,698	45,882	53,461
WWT	523,190	218,946	2,668,672	553,453	156,370	39,480	40,712	38,859	41,497
YWT	323,631	97,030	1,089,404	321,421	108,560	12,546	34,994	18,012	27,951
FWT	218,160	92,862	-	-	121,662	10,339	11,782	12,491	-
SS	43,971	9,046	84,263	11,075	15,699	-	464	3,358	-
Rib f H	45,630	8,818	32,713	3,838	11,340	-	2,741	-	-
Rib f B	66,943	17,822	38,665	3,495	11,018	-	4,109	-	-
IMF H	24,272	3,422	30,738	3,742	-	-	-	-	-
IMF B	31,113	3,731	36,533	3,476	-	-	-	-	-

*Ireland merged with UK

Approach

- Accumulate pre-adjusted phenotypic data from participating countries
 - Data on 6.65 million animals
- **Identify / collate common animals in pedigrees**
 - direct links: sires with performance recorded progeny in more than one country
 - indirect links common parents in pedigree
 - eg embryos sold to various countries

Outcomes

- Linkage database across 10 countries
 - AGBU with the help of many contributing parties in particular Agricultural Business Research Institute
 - Database is WEB based



INTERNATIONAL CROSS REFERENCE DATABASE

Update Database

- Home
- Search
- Contact Us

Animal Details

Animal BT BUTLER 452M
Origin United States
Sex M
Date of Birth 28/02/1980
Is Verified Yes

Country	Animal Code
Sweden	0000561984
United States	21830428
United Kingdom	452M/17
Argentina	629
South Africa	8794521
New Zealand	999980004
Canada	C02156670
Australia	H1017452M
Uruguay	SB1067

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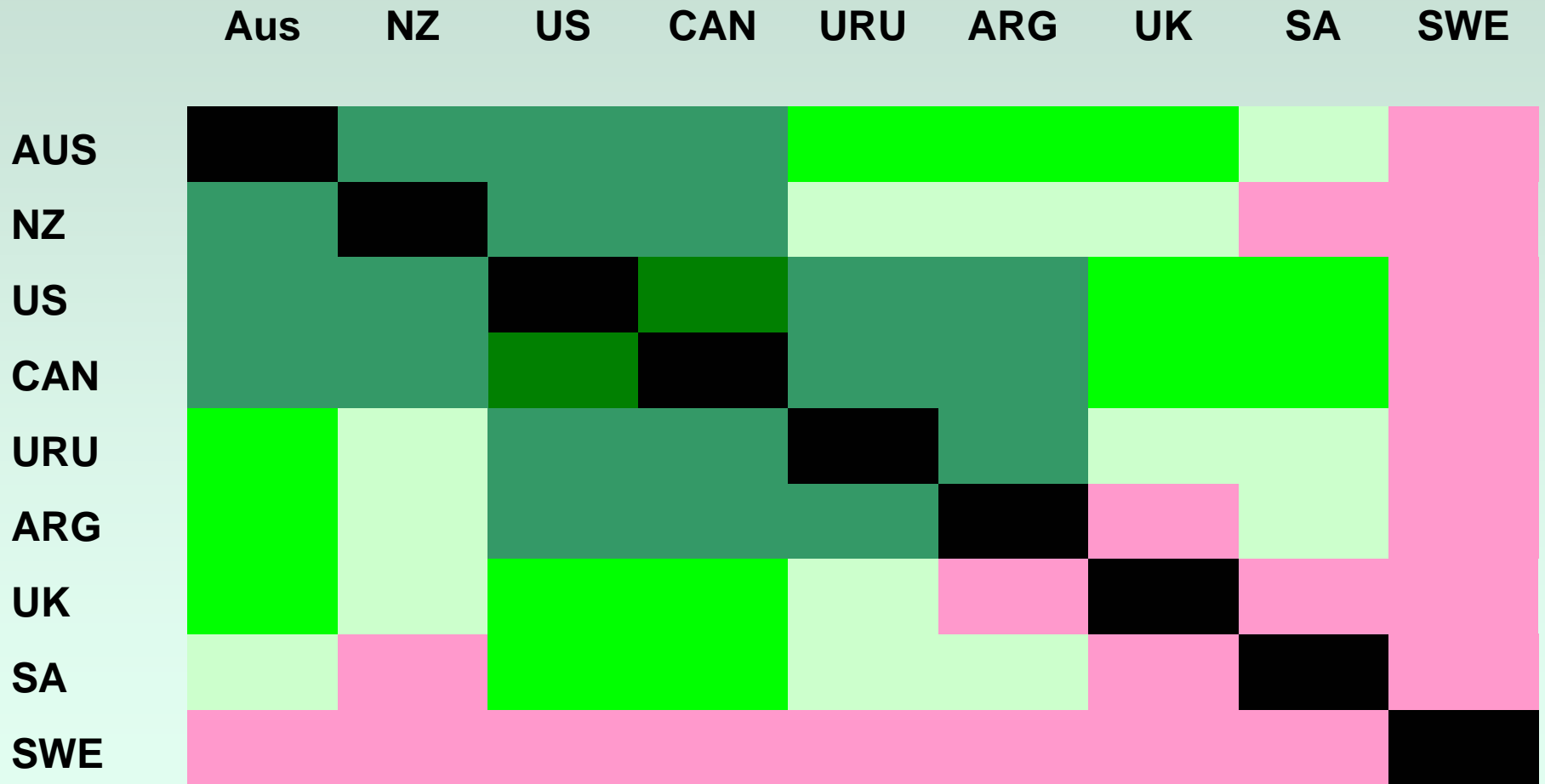
Outcomes

- Linkage database across 10 countries
 - AGBU with the help of many contributing parties in particular Agricultural Business Research Institute
 - Database is WEB based
 - To date little use or updates have been recorded

Linkage

- 5984 link animals identified
 - 82 % originate from US and Canada
17 % from Aus and NZ
86 from UK and 10 URU
 - 4297 in 2 countries
1026 in 3 countries
660 in 4 countries or more
7 sires in 9 countries

Linkage between countries



> 300 sires



< 20 sires

Global Evaluation

- For each trait (eg Birth weight) we performed one evaluation
- Breeding Values between countries are correlated
 - Correlations have been estimated from EBVs from single country sire EBVs
- Each country gets an EBV for each animal in its unit of measurement

Example of correlations between countries Birth Weight

	AUS	NZ	US	CAN	URU	ARG	UK	SA	SWE
AUS	1.00	0.88	0.90	0.89	0.73	0.71	0.84	0.82	0.70
NZ		1.00	0.89	0.97	0.91	0.84	0.64	0.82	0.60
US			1.00	0.93	0.77	0.84	0.89	0.71	0.43
CAN				1.00	0.80	0.86	0.79	0.58	0.54
URU					1.00	0.75	0.86	0.33	0.55
ARG						1.00	1.18(3)	0.55	0.69
UK							1.00	0.13	0.38
SA								1.00	0.73
SWE									1.00

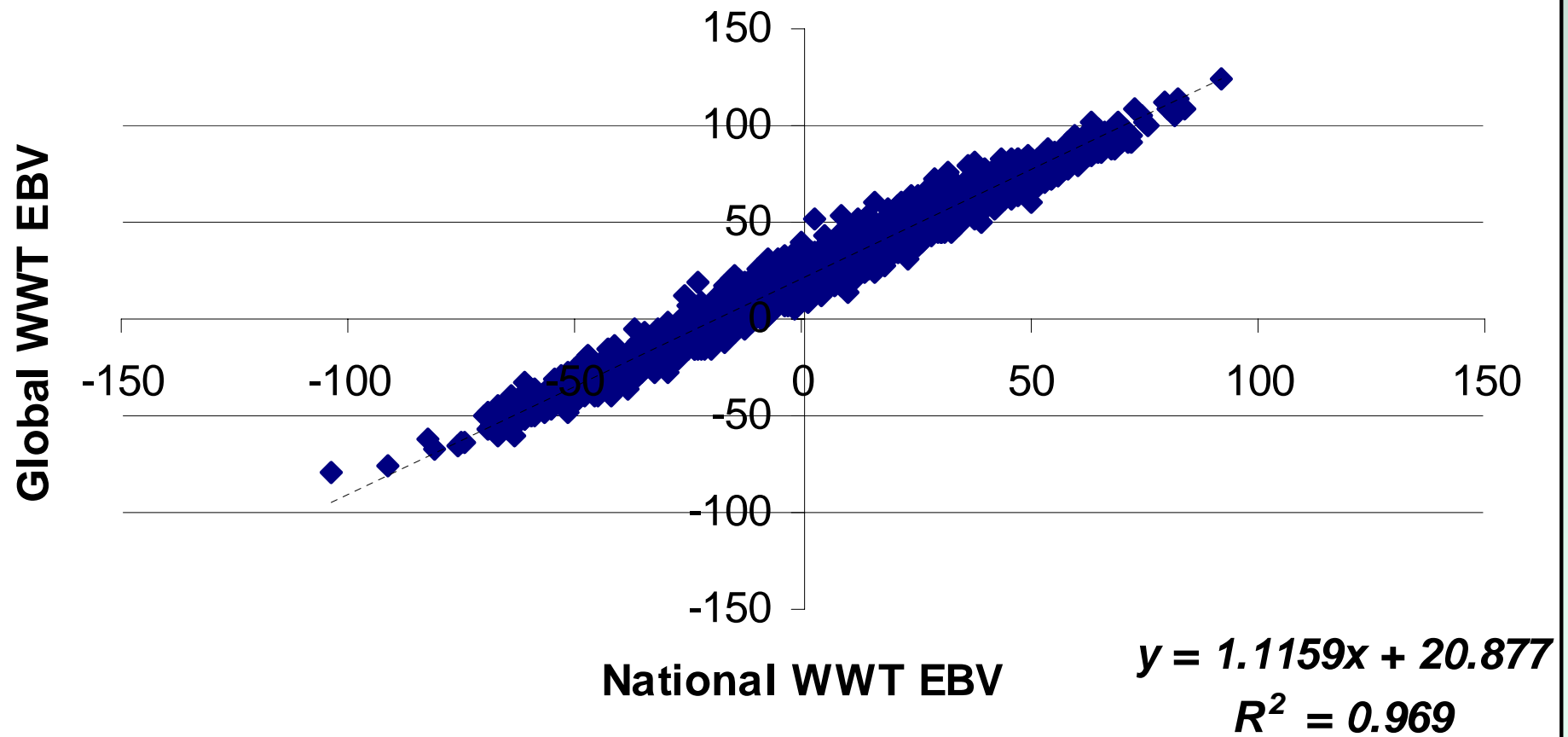
Example of correlations between countries

Weaning weight – Milk/Maternal

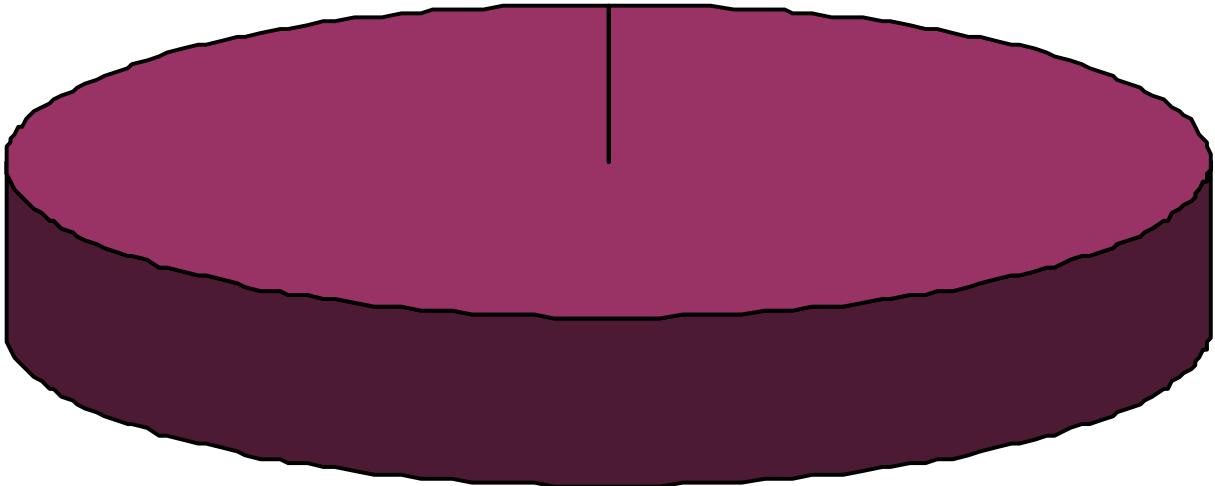
	AUS	NZ	US	CAN	URU	ARG	UK	SA	SWE
AUS	1.00	0.82	0.66	0.81	0.45	0.39	0.76	0.01	0.20
NZ		1.00	0.68	0.75	0.32	0.69	0.71	-0.08	-0.04
US			1.00	0.90	0.61	0.67	0.78	0.50	0.27
CAN				1.00	0.49	0.83	0.72	0.55	0.25
URU					1.00	0.82	-0.43	0.48	0.31
ARG						1.00	-	0.74	0.33
UK							1.00	0.13	0.38
SA								1.00	0.49
SWE									1.00

Some results restricted to
Weaning Weight
and high accuracy sires
and three countries
US, UK and SWE

US national vs global WWT EBV

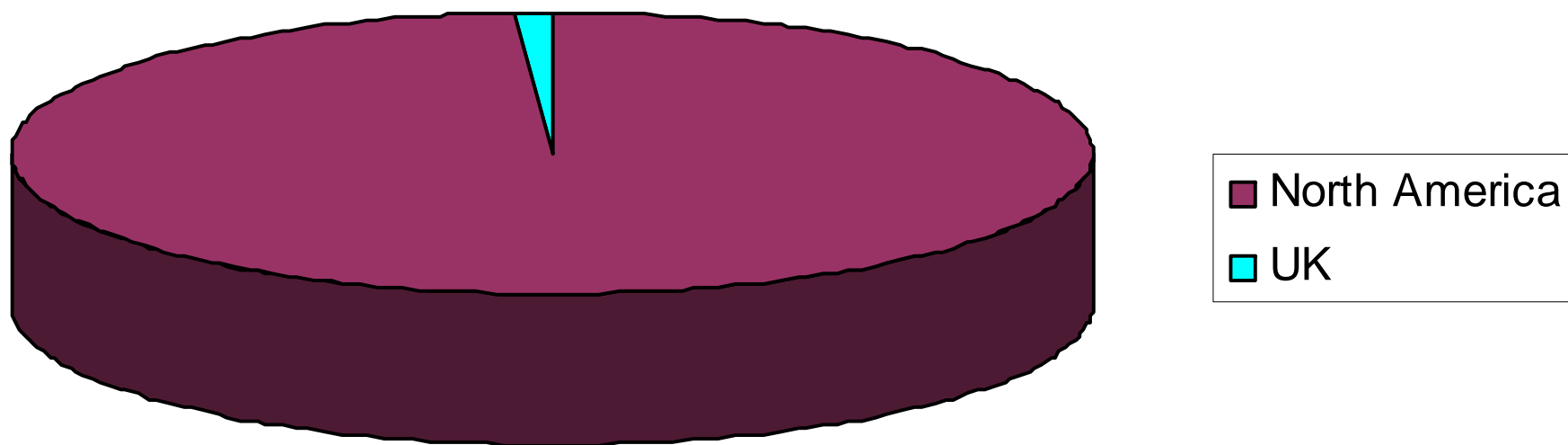


Origin of Top 100 sires sorted by US national EBV

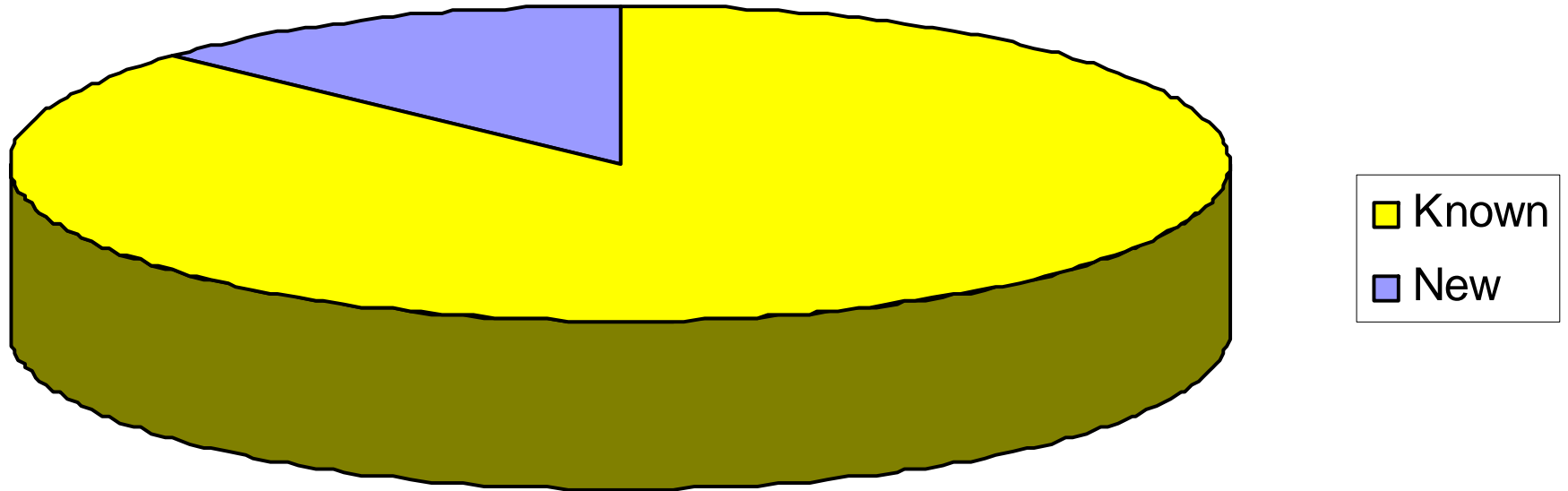


■ North America

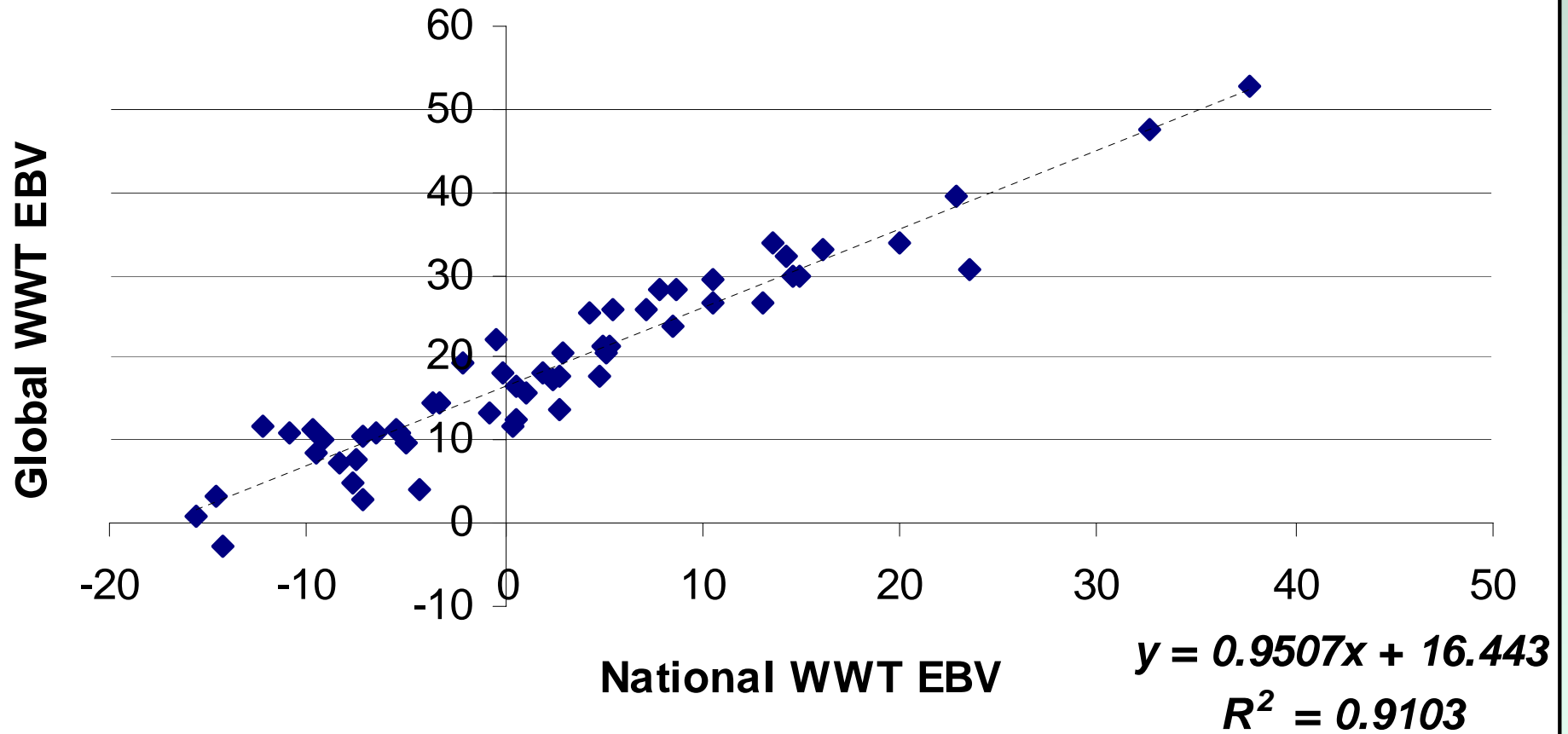
Origin of Top 100 sires sorted by US global EBV



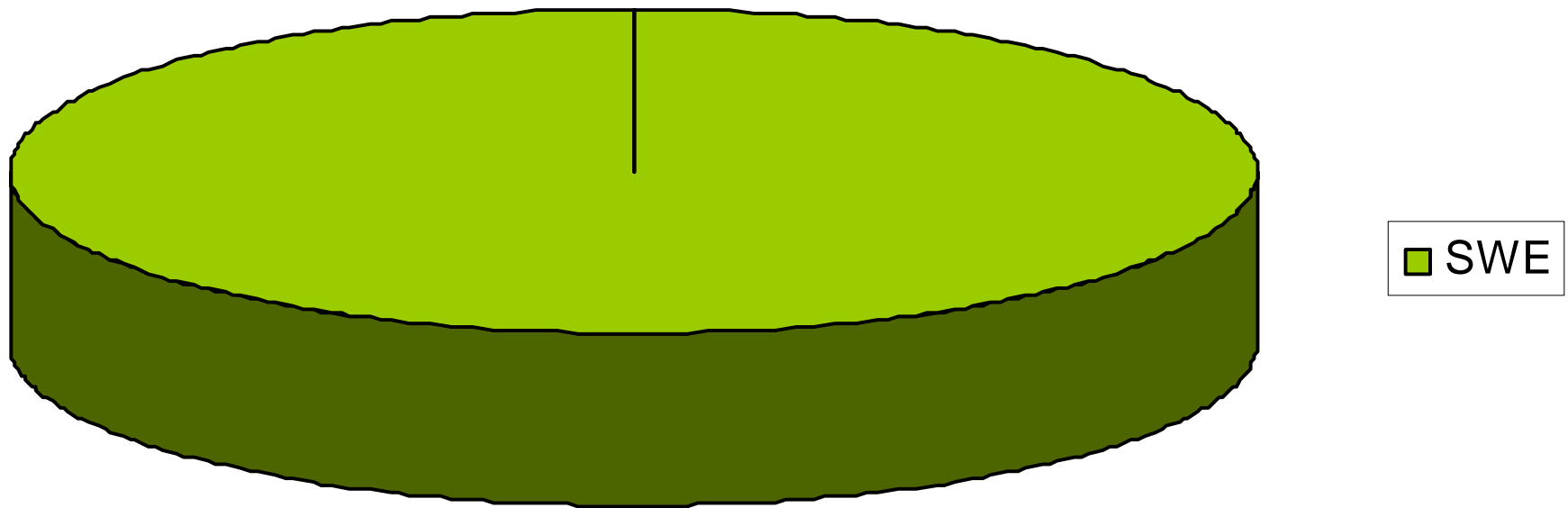
New and known sires with US global EBV



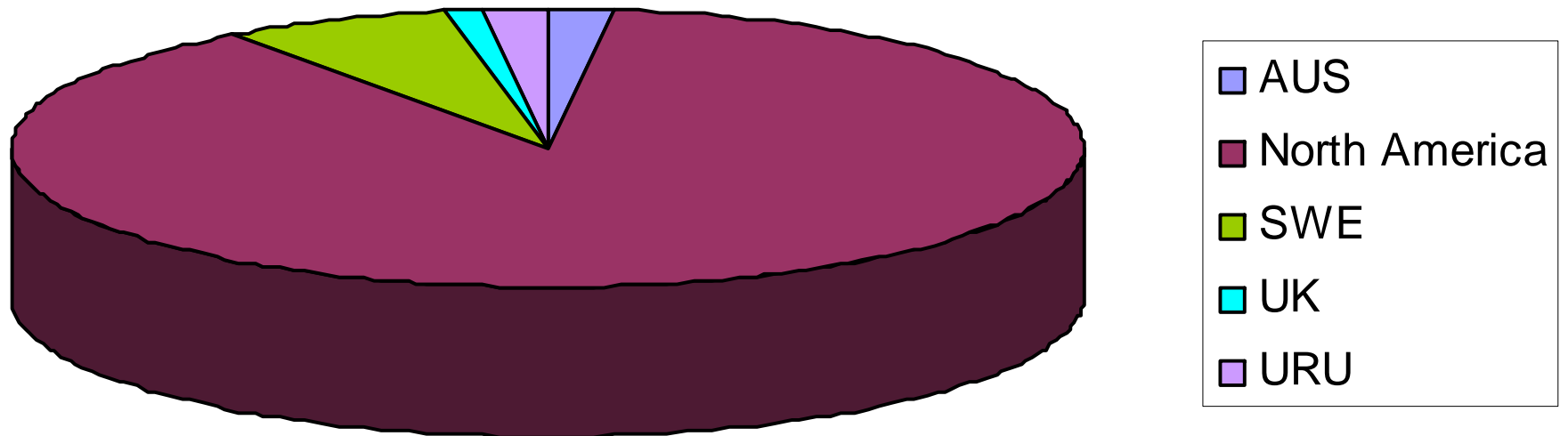
SWE national vs global WWT EBV



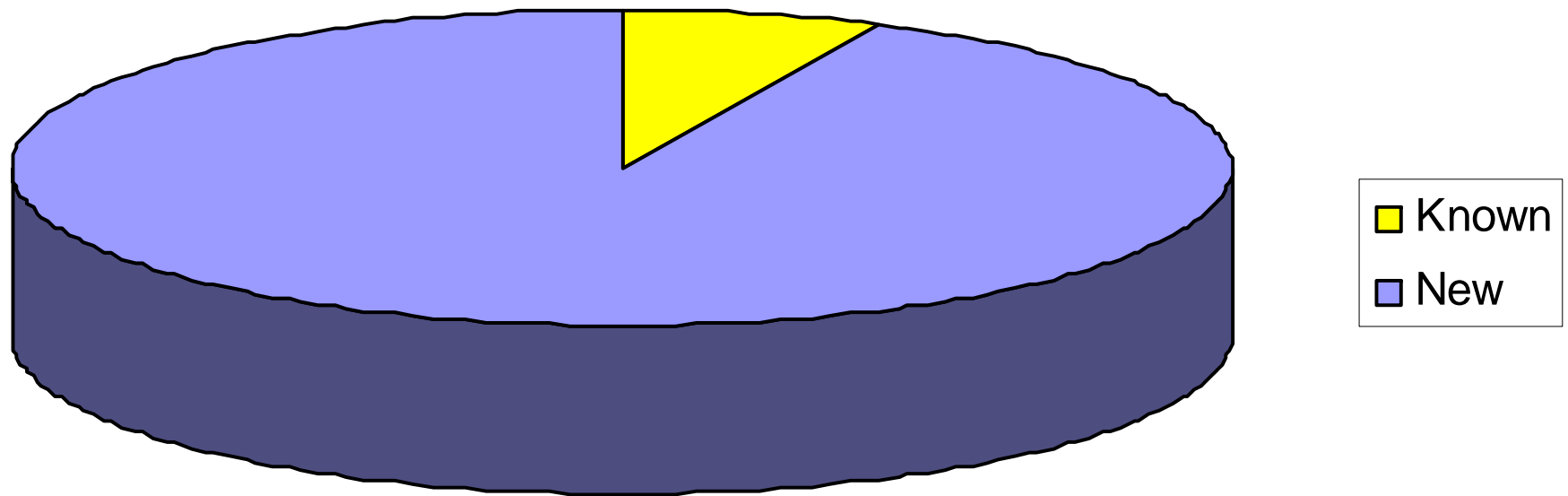
Origin of Top 100 sires sorted by SWE national EBV



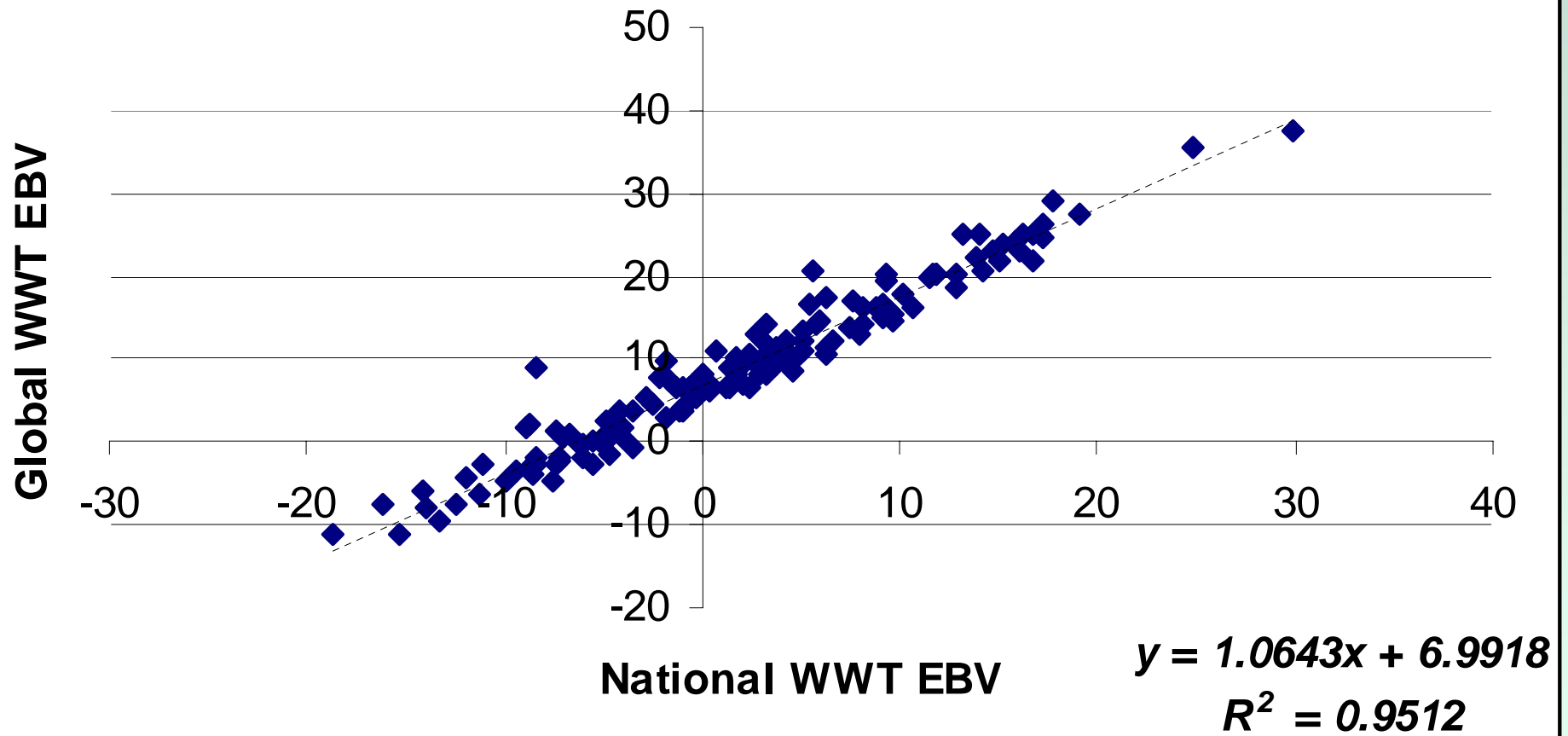
Origin of Top 100 sires sorted by SWE global EBV



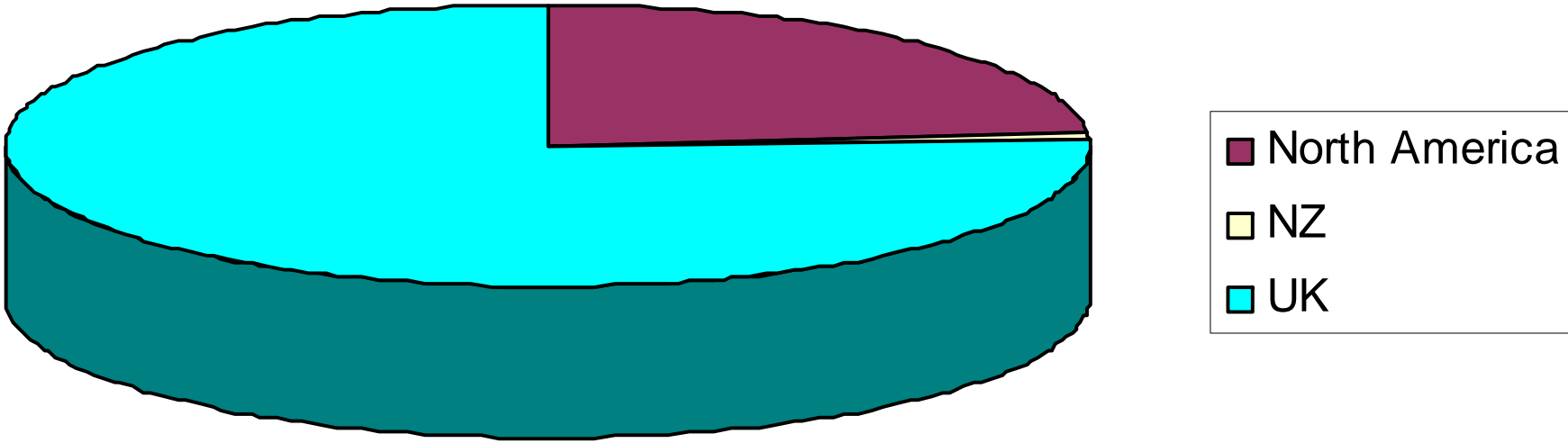
New and known sires with SWE global EBV



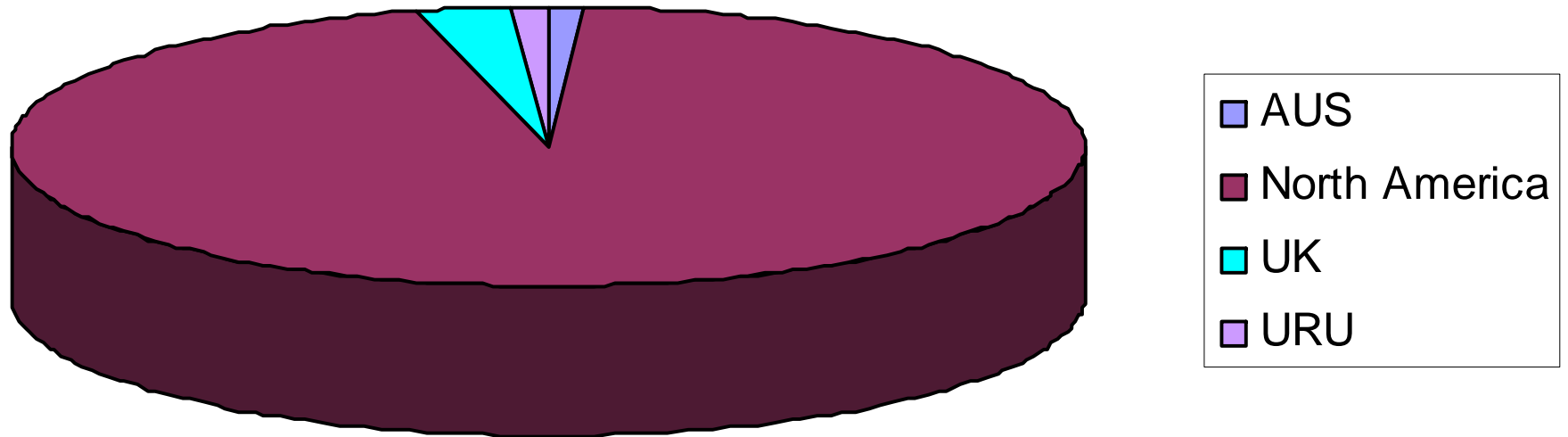
UK national vs global WWT EBV



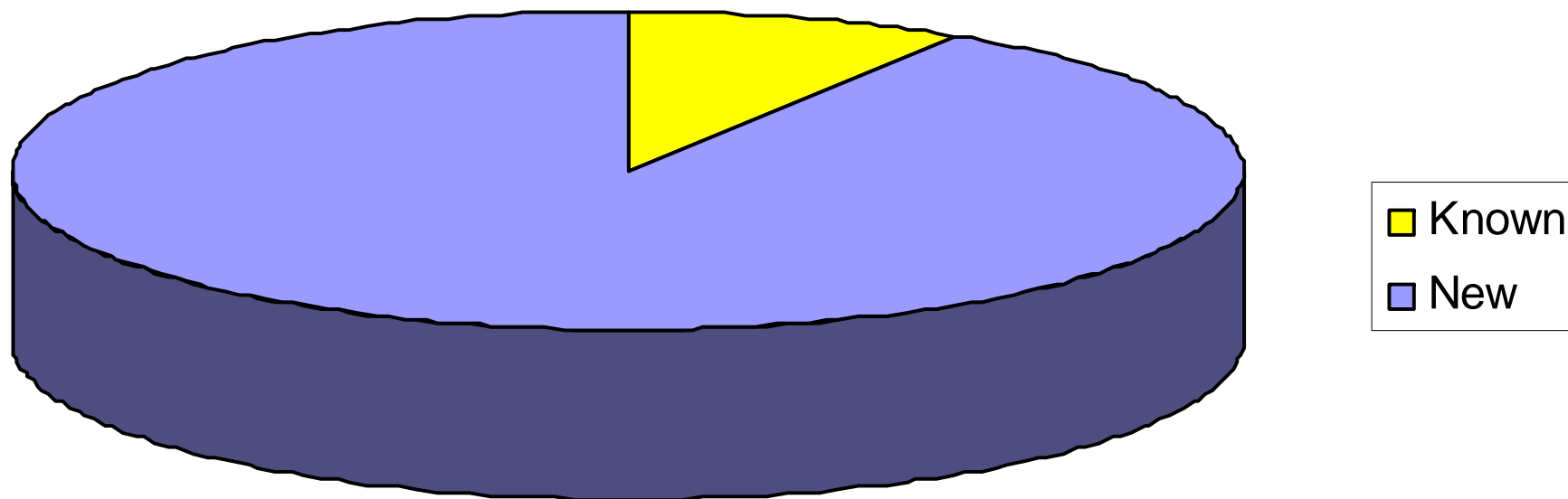
Origin of Top 100 sires sorted by UK national EBV



Origin of Top 100 sires sorted by UK global EBV

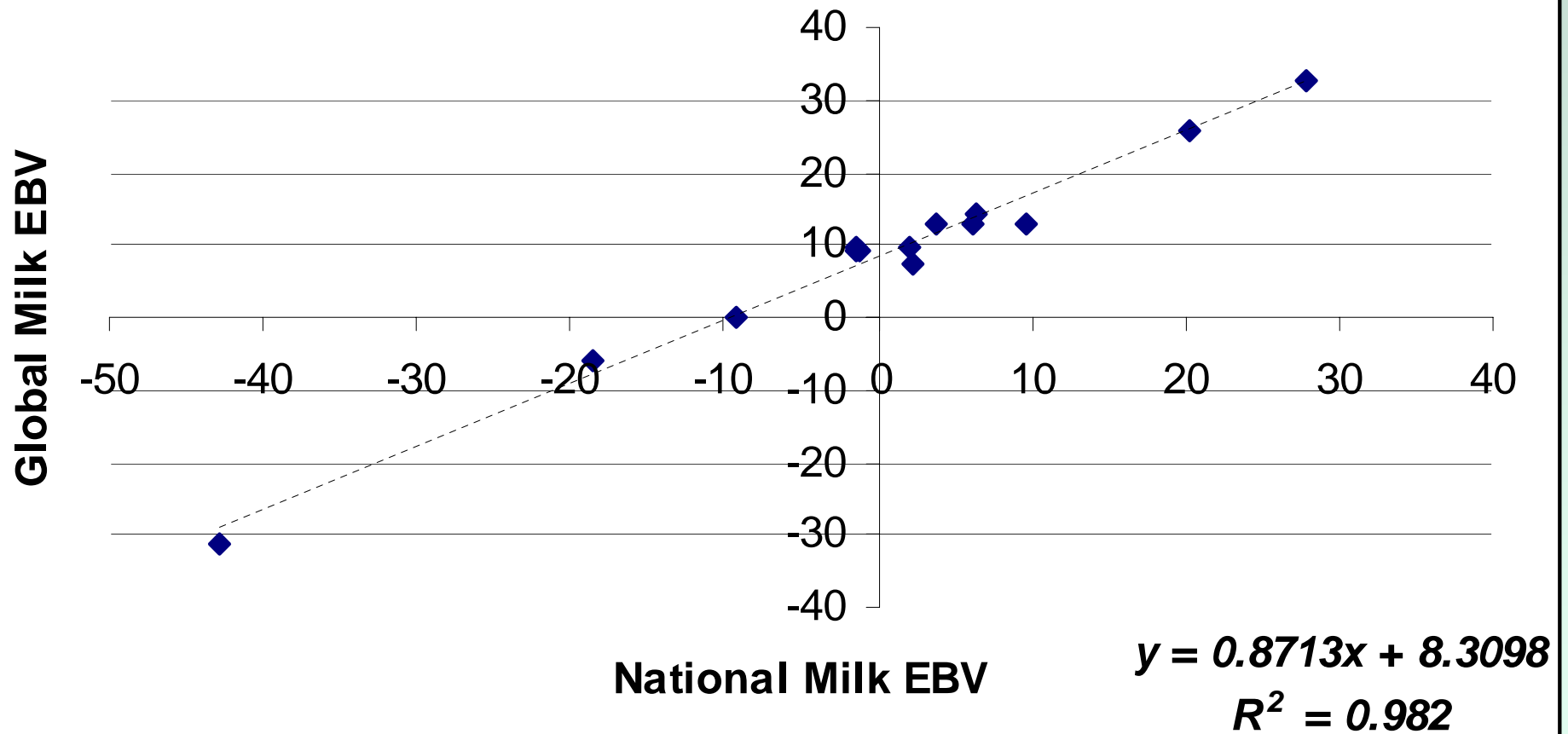


New and known sires with UK global EBV

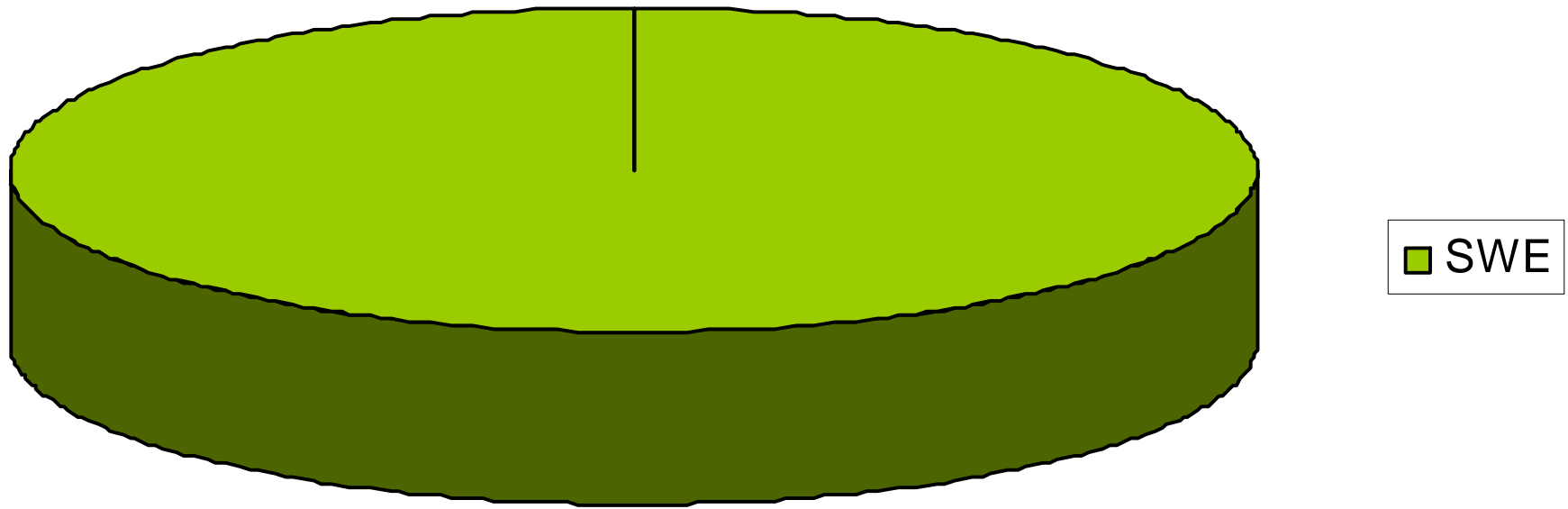


Weaning Weight Milk

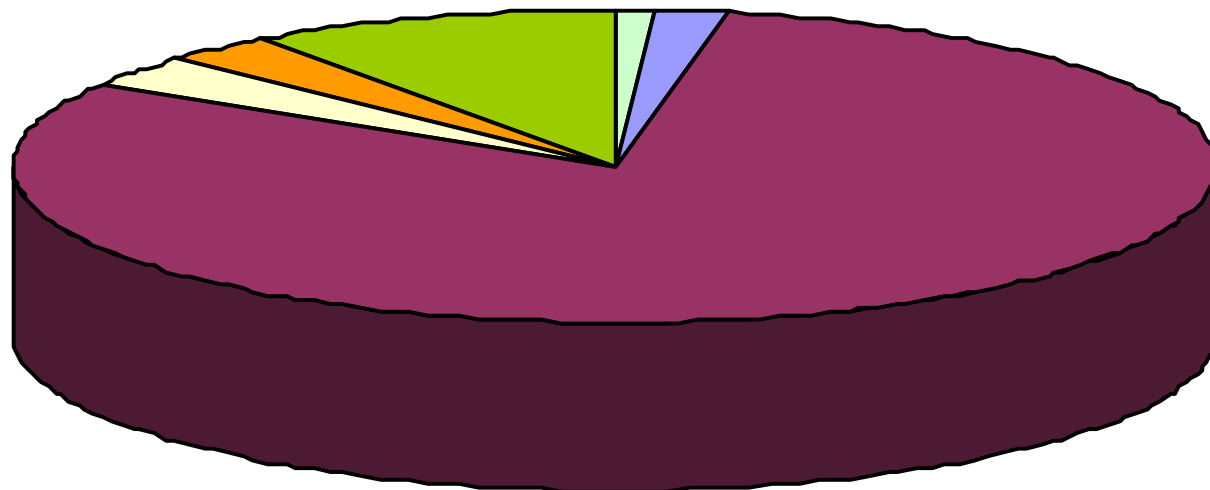
SWE national vs global Milk EBV



Origin of Top 100 sires sorted by SWE national EBV



Origin of Top 100 sires sorted by SWE global EBV



- ARG
- AUS
- North America
- NZ
- SA
- SWE

Conclusions

- Global evaluations for single traits are feasible
- Linkage for some countries might have caused problems estimating “realistic” genetic correlations – use conservative values
- All participating countries will be benefit
- More work required before single sire values can be presented.

Our next steps

- Assemble new extract by 09/2008
- Use estimated genetic correlations
- Trait by trait evaluation
- Report best 100 sires for each trait and country back to each country?
 - Or we publish those sires on a web side to give everybody access
- Write short articles for each Country?

Acknowledgement

- The work for this feasibility study has been performed by

Dr Kath Donoghue now

Trangie Agricultural Research Station
NSW Department of Primary Industries

and

Dr Bruce Tier, AGBU

Dr David Johnston

Mr Andrew McCann (Linkage database)