Revision of Economic Values in the EBI

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Introduction

- EBI launched in February 2001
- Economic values were derived using prevailing costs and prices at that time
- Regular revision is vital to account for changing economic policies and inflation

Objective

- To revise the economic values in the EBI to account for inflation, changes in levies, transport and processing costs
- To include the impact of the Fischler proposals

Materials

- **Moorepark Dairy Systems Model *(Shalloo et al., 2004)***
- **Three quota scenarios:**
  - **S1 = fixed number of cows, quota purchasing**
  - **S2 = fixed number of cows, no quota**
  - **S3 = variable number of cows, fixed output per farm**

Changes since February 2001

- Revised replacement heifer costs
- Up-to-date lactation curves
- Updated levies, processing, transport and cooling costs
- Inflation
- Projected quota purchasing costs
- Fischler prices (Milk, cull cow, calf)

Replacement Heifer Costs

- **Includes costs of production rather than market value**
- **Costs:**
  - **Variable costs including opportunity cost of land @ €108/acre and mortality**
  - **Fixed costs including labour with 15 hours/heifer @ €12.44/hour**
  - **Opportunity cost of calf (€330)**
  - **Sale of heifers failing to conceive**

Total
€1,319

Lactation Curves

- Derived from 0.5 million lactation records
- SLAC curves
- Parity structure 26:18:16:40, first:second:third:fourth plus

Milk Price

	2000		2003	
	Fat	Protein	Fat	Protein
Reference milk	3.60%	3.30%	3.60%	3.30%
Gross price kg milk	27.8		21.7	
Price ratio	1	2	1	2
Gross price per kg solids	298	597	210	420

Milk Deductions

	2000	2003
Levies	1.12	0.58
Cost of Transport	1.07	1.50
Cost of Cooling	0.25	0.25
Cost of Processing	1.63	4.00
TOTAL DEDUCTIONS (cents/kg)	2.946	5.754

Inflation and Quota Purchasing

- Most up-to-date costs of production included
- Cost of quota includes capital and interest repayment (4% over 5 years) on a purchase price of €1/gallon

Fischler Proposals

- All projected prices based on FAPRI projections
- Milk price = 27.8 c/kg to 21.7 c/kg
- Cull cow price = €381 to €270
- Male calf = €190 to €102

Results

Economic values

	Current EBI			Proposed EBI		
	S1 (€)	S2 (€)	S3 (€)	S1 (€)	S2 (€)	S3 (€)
Milk	-0.08			-0.08		
Fat	0.86			1.50		
Protein	5.70			5.22		
Survival	11.40			10.77		
Calving interval	-2.07			-7.09		

Economic values

	Current EBI			Proposed EBI		
	S1 (€)	S2 (€)	S3 (€)	S1 (€)	S2 (€)	S3 (€)
Milk	-0.08	-0.05		-0.08	-0.06	
Fat	0.86	2.54		1.50	2.35	
Protein	5.70	5.70		5.22	5.22	
Survival	11.40	13.30		10.77	11.74	
Calving interval	-2.07	-1.08		-7.09	-7.24	

Economic values

	Current EBI			Proposed EBI		
	S1 (€)	S2 (€)	S3 (€)	S1 (€)	S2 (€)	S3 (€)
Milk	-0.08	-0.05	-0.10	-0.08	-0.06	-0.08
Fat	0.86	2.54	-0.42	1.50	2.35	1.61
Protein	5.70	5.70	5.70	5.22	5.22	5.22
Survival	11.40	13.30	9.98	10.77	11.74	10.91
Calving interval	-2.07	-1.08	-2.81	-7.09	-7.24	-7.12

Relative emphasis

	Current EBI			Proposed EBI		
	S1 (€)	S2 (€)	S3 (€)	S1 (€)	S2 (€)	S3 (€)
Milk	20%			17%		
Fat	8%			12%		
Protein	42%			32%		
Survival	23%			18%		
Calving interval	8%			22%		

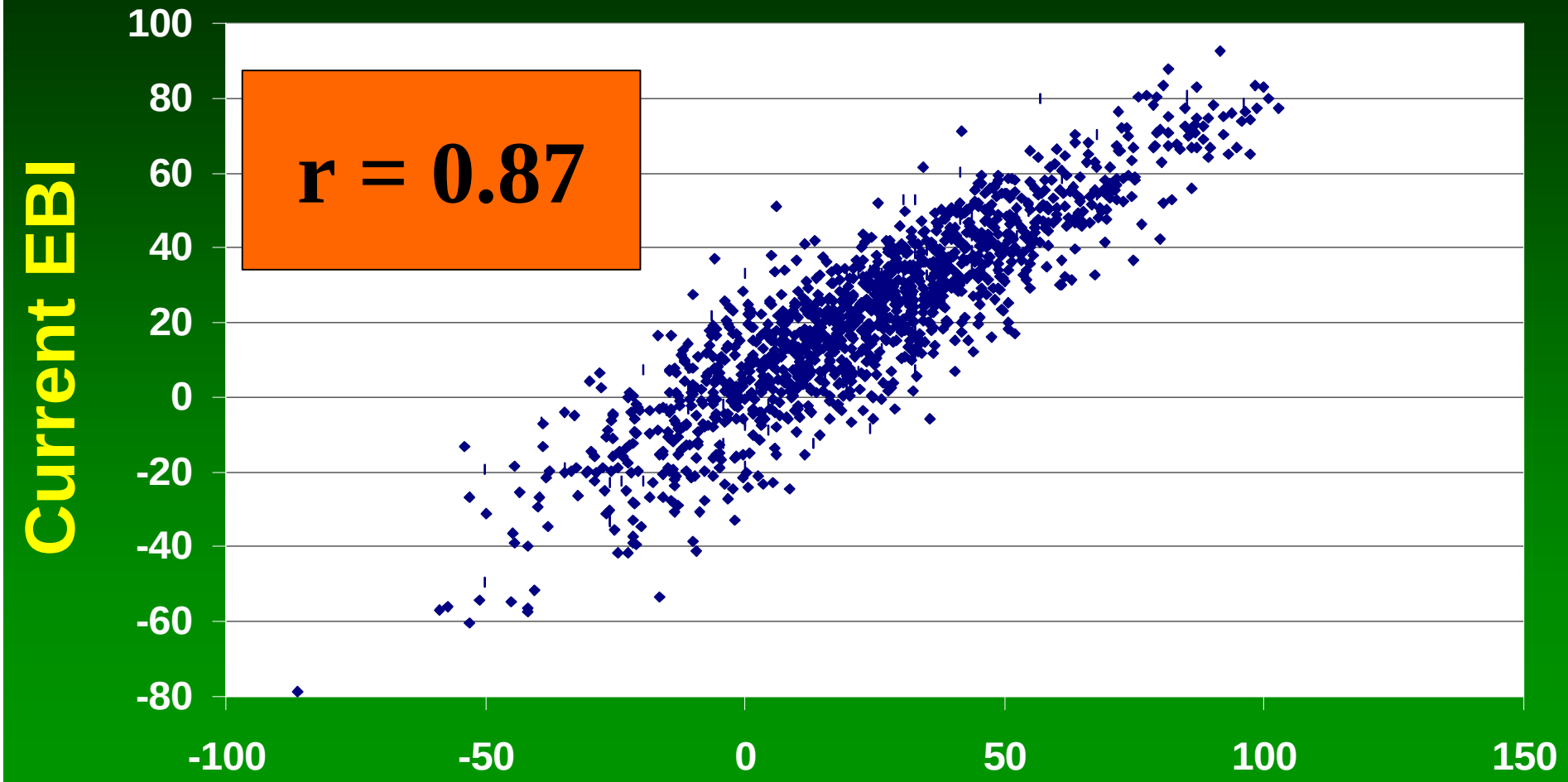
Relative emphasis

	Current EBI			Proposed EBI		
	S1 (€)	S2 (€)	S3 (€)	S1 (€)	S2 (€)	S3 (€)
Milk	20%	11%		17%	13%	
Fat	8%	22%		12%	17%	
Protein	42%	38%		32%	30%	
Survival	23%	25%		18%	19%	
Calving interval	8%	4%		22%	21%	

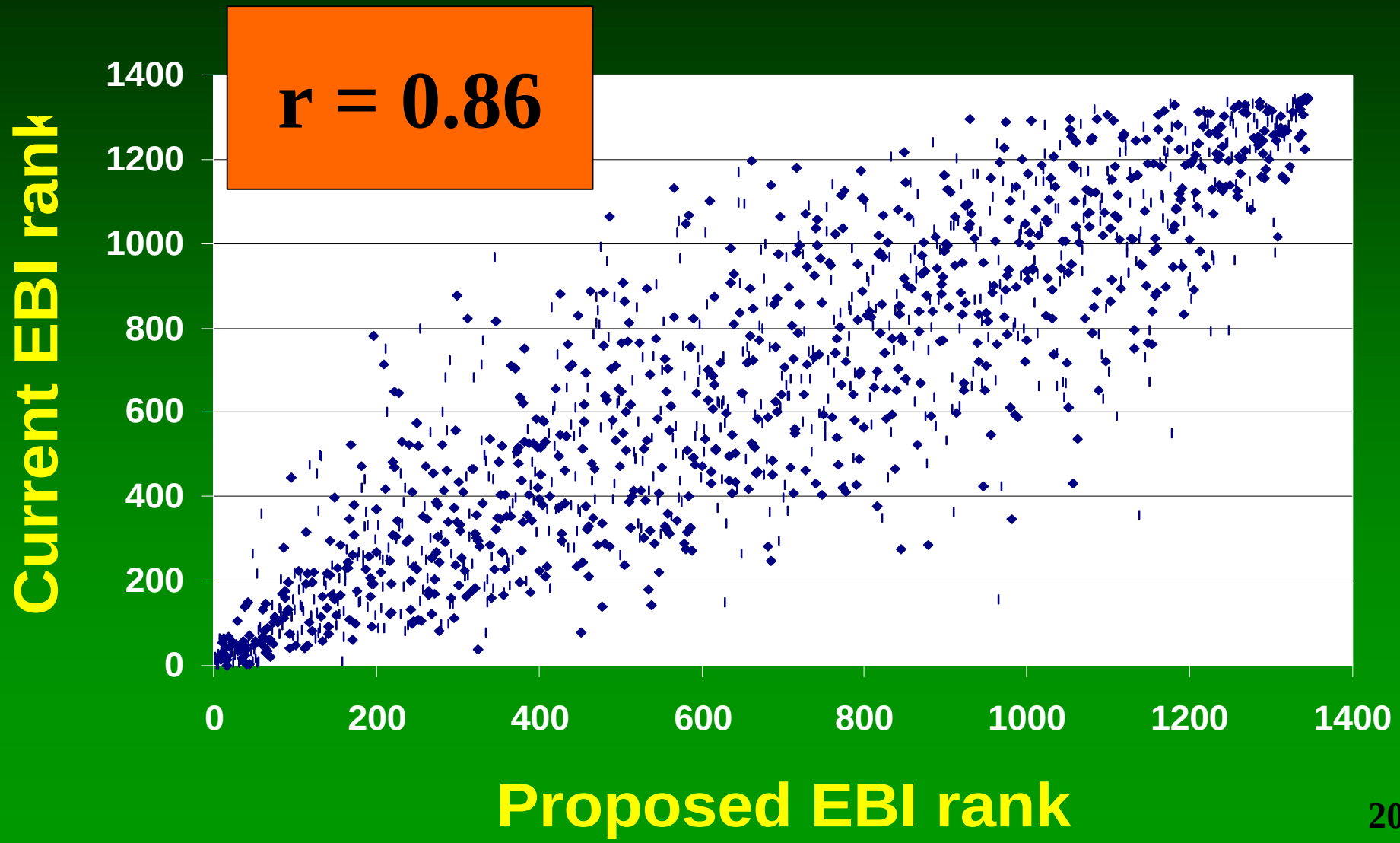
Relative emphasis

	Current EBI			Proposed EBI		
	S1 (€)	S2 (€)	S3 (€)	S1 (€)	S2 (€)	S3 (€)
Milk	20%	11%	25%	17%	13%	16%
Fat	8%	22%	4%	12%	17%	12%
Protein	42%	38%	41%	32%	30%	32%
Survival	23%	25%	20%	18%	19%	18%
Calving interval	8%	4%	10%	22%	21%	22%

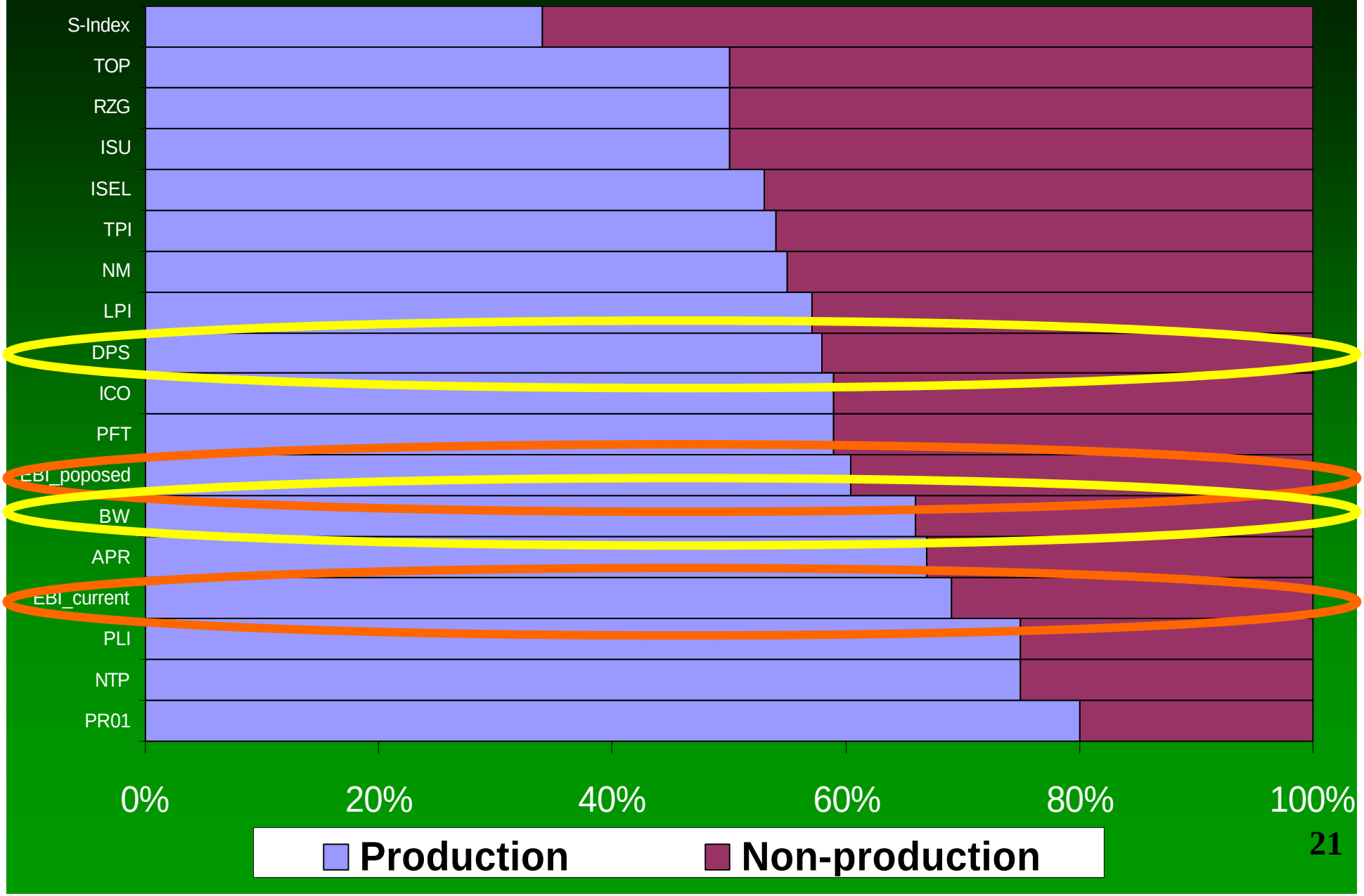
Effect on sire proofs - EBIs



Effect on sire proofs - Ranking



International Comparison



Future Development of EBI

- Inclusion of additional traits within the EBI (e.g., calving ease, udder health, beef merit)
- Suitability of type traits as early predictors of genetic merit for traits of economic importance
  - Joint Teagasc, IHFA, ICBF project

Proposed changes to EBI

	Current		Proposed	
Milk	-0.08	20%	-0.08	17%
Fat	0.86	8%	1.50	12%
Protein	5.70	42%	5.22	32%
Survival	11.40	23%	10.77	18%
Calving interval	-2.07	8%	-7.09	22%

Sensitivity Analysis

- Milk price
- Fat : Protein price ratio
- Replacement heifer cost
- Recycling of animals
- Quota purchasing cost

Recycling of Cows

- May be milked throughout second year or dry throughout second year
- DairyMIS data - 14 spring calving herds
- 5,164 cows in analysis
- Replacement rate = 30%
  - 20% of replacements were recycled
- Of cows recycled 24% milked throughout; 76% dry

Sensitivity - Recycling

	Proposed	Recycling	Replacement heifer -€200
Milk	-0.08	-0.08	-0.08
Fat	1.50	1.50	1.50
Protein	5.22	5.22	5.22
Survival	10.77	9.79	8.74
Calving Interval	-7.09	-7.06	-7.02

Sensitivity - Milk price

	21.7c/kg	18c/kg	24c/kg
Milk	-0.08	-0.08	-0.08
Fat	1.50	1.13	1.73
Protein	5.22	4.48	5.68
Survival	10.77	9.96	11.28
Calving Interval	-7.09	-6.95	-7.18

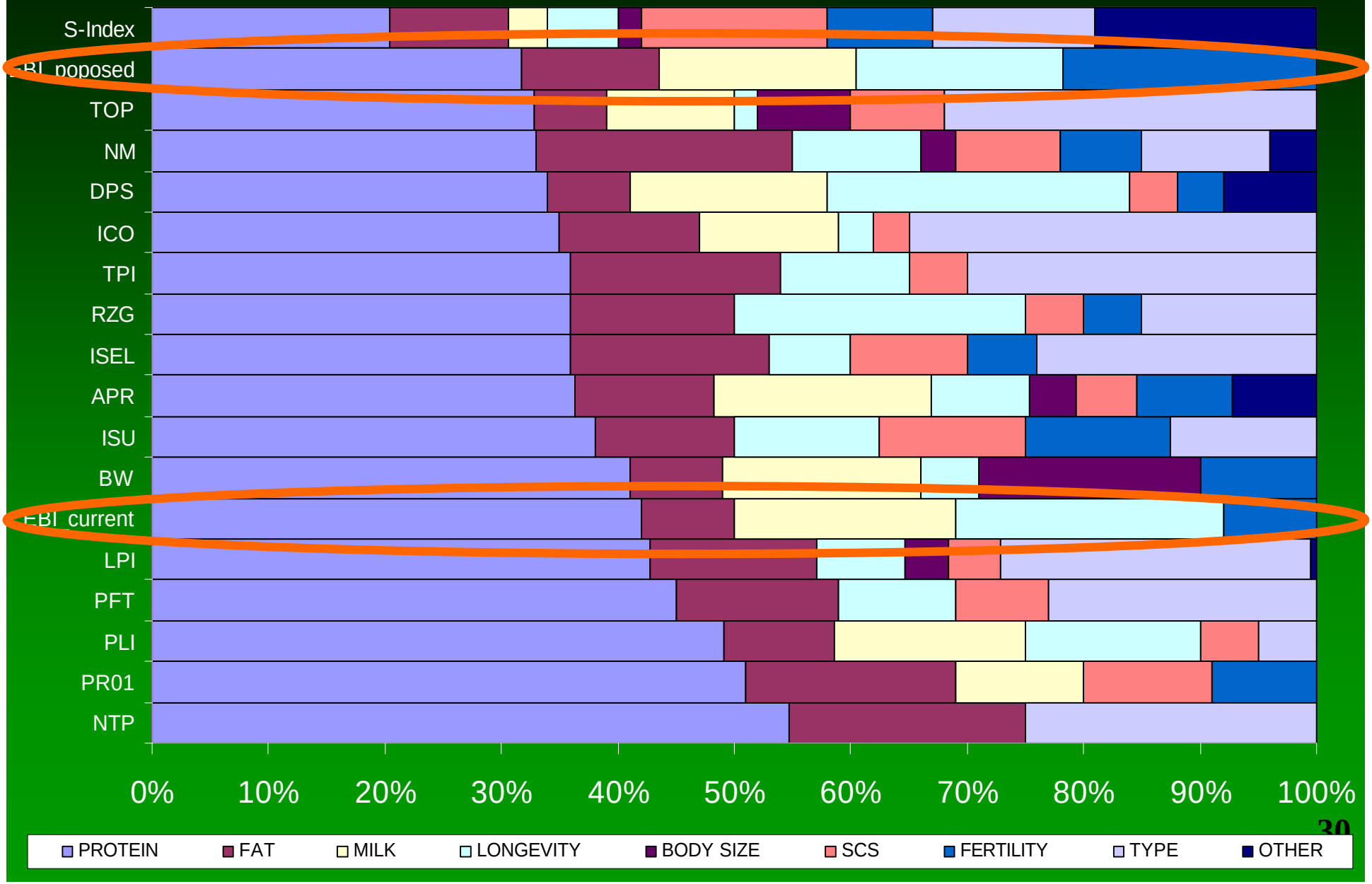
Sensitivity - Fat to Protein price ratio

	Fat:Protein (1:2)	Fat:Protein (1:4)
Milk	-0.06	-0.06
Fat	2.35	1.29
Protein	5.22	6.38
Survival	11.74	11.73
Calving Interval	-7.24	-7.31

Sensitivity - Quota purchasing

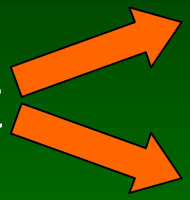
	€1/gal	€1.15/gal	€0.85/gal
Milk	-0.08	-0.08	-0.08
Fat	1.50	1.37	1.63
Protein	5.22	5.22	5.22
Survival	10.77	10.62	10.91
Calving Interval	-7.09	-7.07	-7.11

International comparison



Movement of Sire Proofs

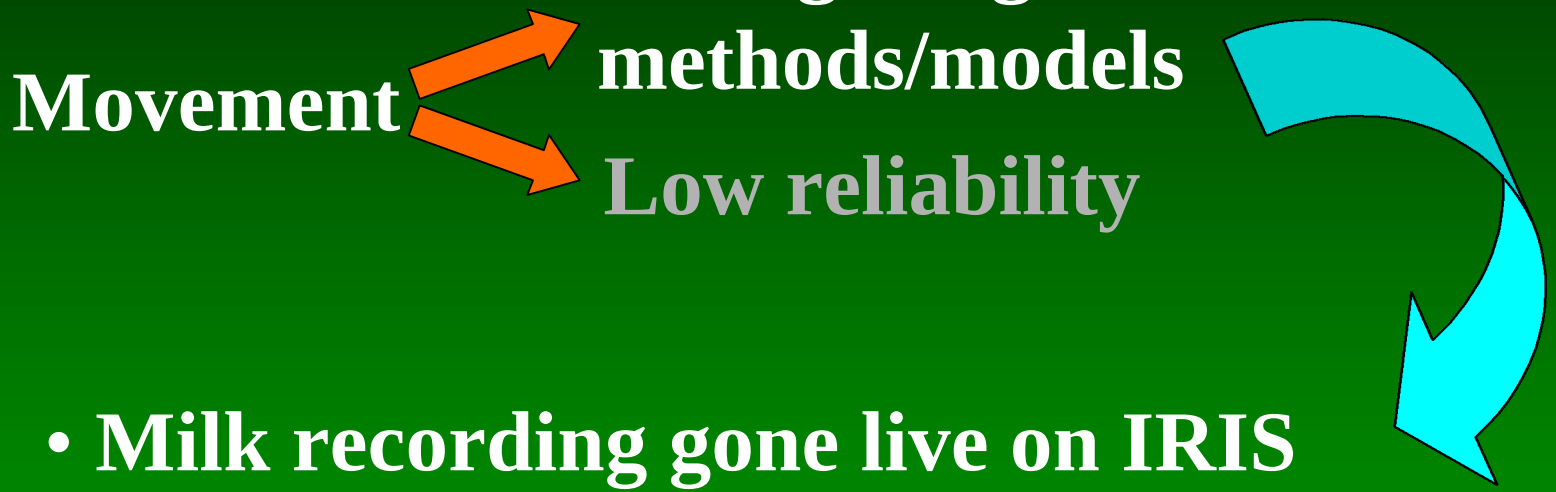
Movement



Change in genetic evaluations
methods/models

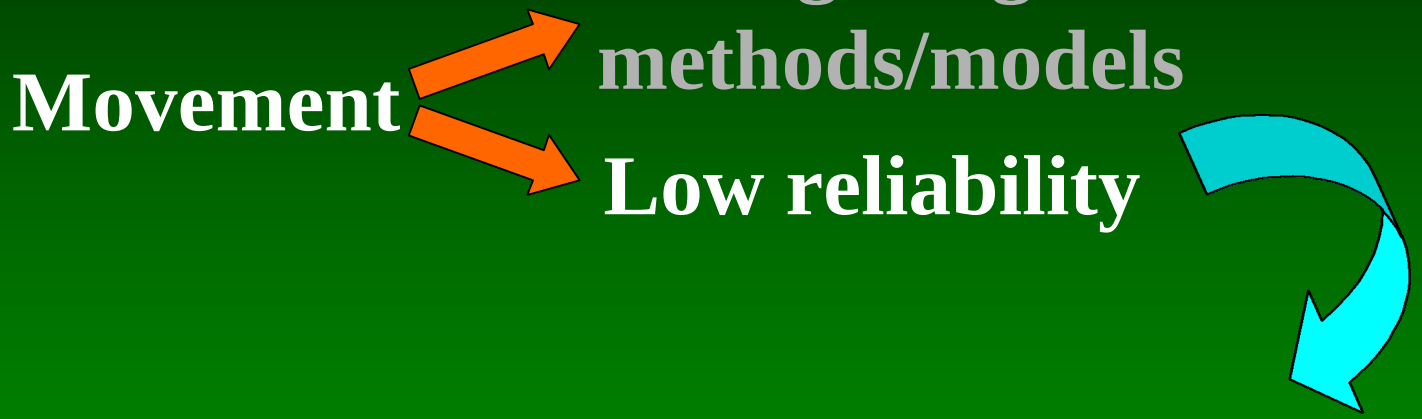
Low reliability

Movement of Sire Proofs



- Milk recording gone live on IRIS
- Sire model replaced by an animal model
- Enhancements to genetic evaluation model
- Adjustment for fixed effects within the model
- Change in base

Movement of Sire Proofs



- Prediction error variance = $(1\text{-Rel})*\acute{o}_g^2$
- Expect 5% to be outside the range specified
- From Feb02 to Nov03, 2%, 12% and 10% of PDs for milk yield, survival , and calving interval were outside the allowed ranges

Reliability

- Prediction error variance = $(1\text{-Rel})*\acute{o}_g^2$

Reliability	Milk	Calving interval	Survival
30	+/- 439	+/- 3.76	+/- 5.86
50	+/- 371	+/- 3.18	+/- 4.95
90	+/- 166	+/- 1.42	+/- 2.21
95	+/- 117	+/- 1.01	+/- 1.57
99	+/- 53	+/- 0.45	+/- 0.70