

Combined Breed Analysis



Samuel Boon, Signet Manager
and AHDB Beef and Lamb Breeding Specialist

Overview



- Background
- Research completed
- Research to be done
- Consultation & implementation

Current success

- High rates of genetic gain
- Breeders are using EBVs to add value to ram sales
- Increase in demand for recorded rams
- Commercial understanding is increasing

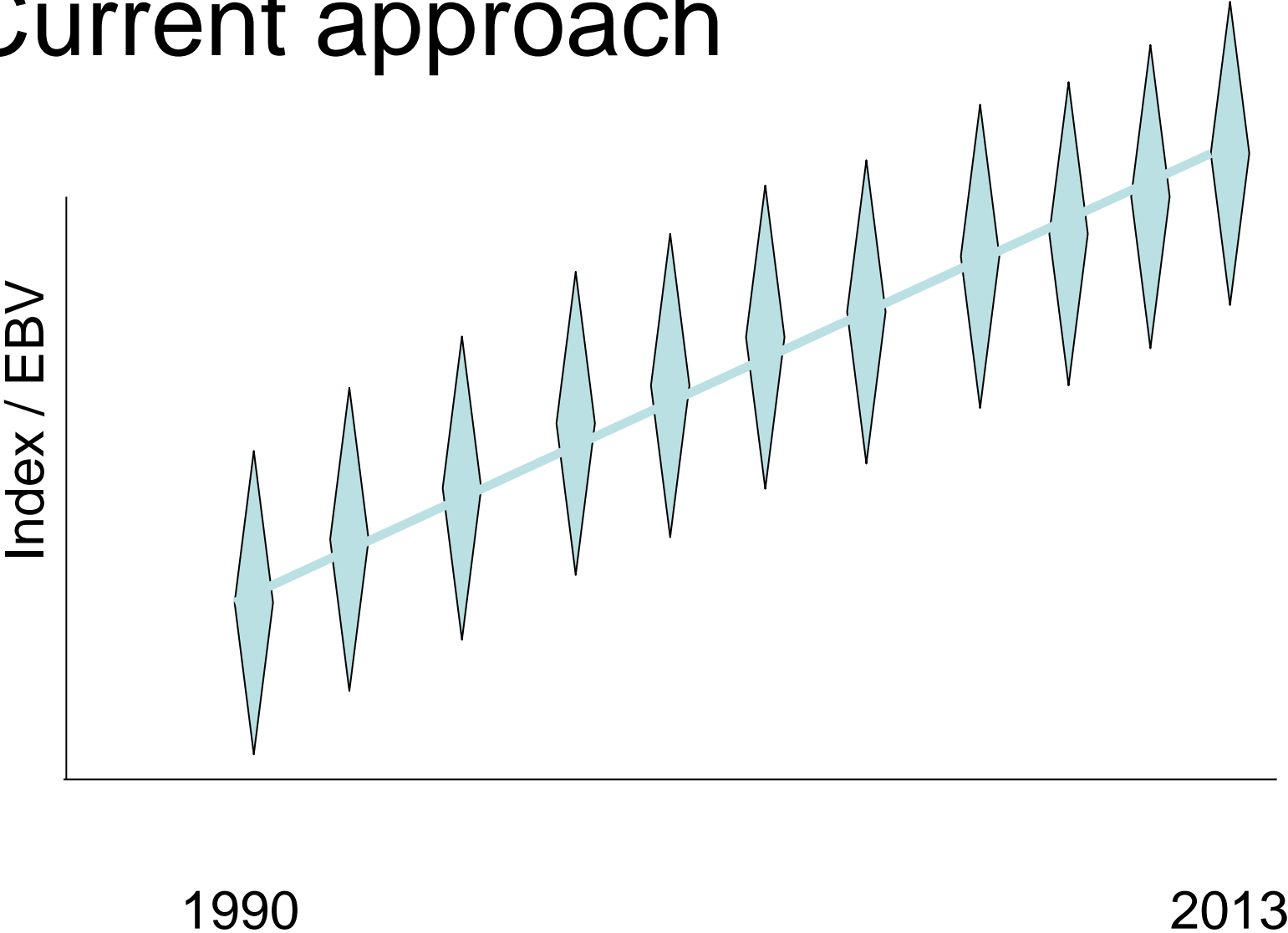
Current Challenges

Breeders are looking for more regular BLUP information – 3 runs a year is limiting

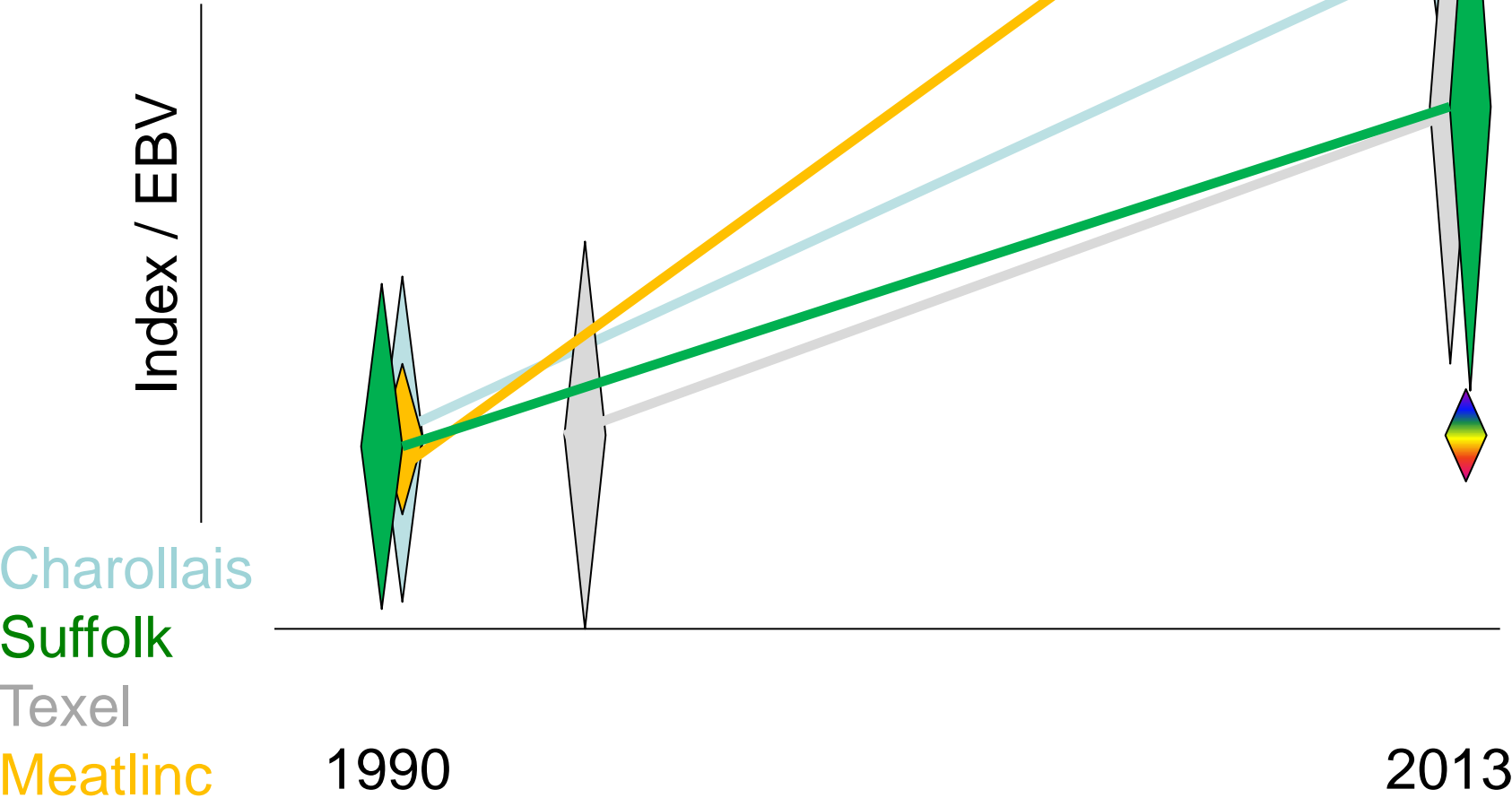
More crossbred animals and crossbred flocks are looking for useful EBVs

The EBVs need to be rebased

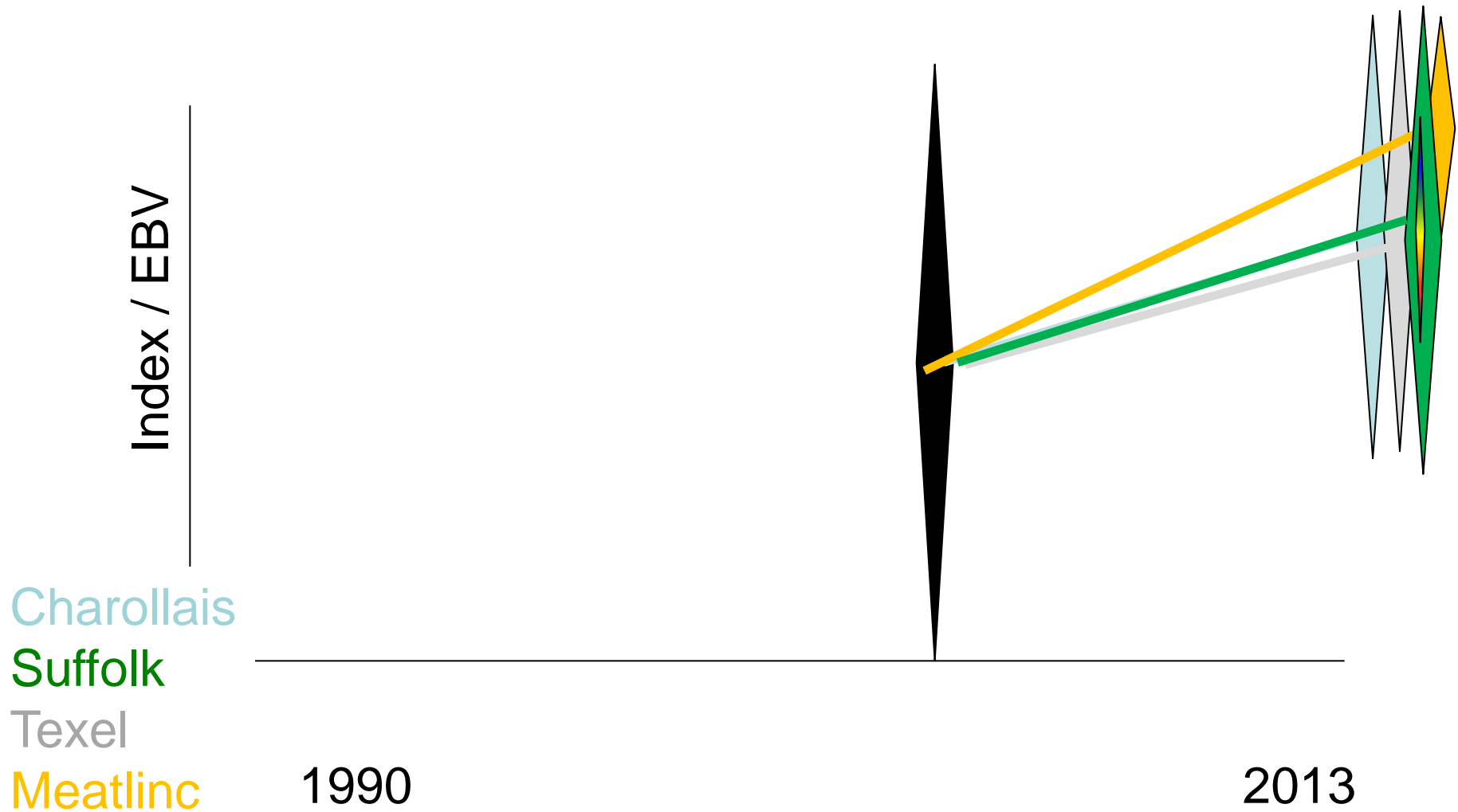
Current approach



Current approach



Across breed approach



Who is involved?

Breeds included

- Texel
- Suffolk
- Meatlinc
- Charollais
- Hampshire Down
- Beltex
- Blue Texel
- Blue Du Maine
- Vendeen
- Southdown
- Dorset
- Shropshire

Milestones

- SBRT13 – 97% in favour
- SRUC proposal to AHDB
 - Funding agreed in January 2015
 - With a view to delivering in 2016

Project Objectives

- Re-base the population to a more relevant population
- Review the genetic parameters & breeding indexes
- Provide a mechanism for breed comparison in the future
- Enable crossbred animals to be analysed
 - Take into account hybrid vigour
- Enable a more efficient and frequent service
- Improve rates of genetic improvement
 - potentially providing more accurate EBVs
 - widening the gene-pool for selection

Commercial context

The new breeding information will be:

- easier to interpret
- more accurate (particularly for crossbreds)
- enable breed comparison in the future
- enable a more frequent and efficient genetic evaluation service

Research to date

Proportion of Each Breed (PEB%)

- Work out “breed” based on parentage
 - Take into account unknown parents
 - Deal with missing breed 16ths
- Showed other breeds with records
 - 4383 records of Lleyn x Texel for examples

Most common first crosses

(>40 to <60% of one breed)

Breed 1	Breed 2
TEXEL	CHAROLLAIS
TEXEL	SUFFOLK
SUFFOLK	CHAROLLAIS
TEXEL	SHROPSHIRE
SUFFOLK	DORSET DOWN
MEATLINC	ILE DE FRANCE
SUFFOLK	ILE DE FRANCE
SUFFOLK	HAMPSHIRE DOWN
MEATLINC	VENDEEN
TEXEL	BELTEX
TEXEL	BLEU DU MAINE
MEATLINC	BERRICHON DUCHER
CHAROLLAIS	VENDEEN
SUFFOLK	ROUGE DELA OUEST

Research to date

Genetic parameters have been reviewed

- Changes will have an impact on EBVs
- Final rounds of discussion

Which heritabilities?

	w8w	swt	md	fd	mat_sz	lsb	ct_lean	ct_fat	ct_musc
Beltex	0.47	0.63	0.68	0.67	0.65		0.55	0.60	0.70
Shopshire	0.12	0.19	0.30	0.35	0.46	0.12			
Blue Texel	0.20	0.24	0.22	0.23	0.35	0.10			
Bleu du maine	0.20	0.24	0.22	0.23	0.35	0.10			
Vendeen	0.20	0.24	0.22	0.23	0.35	0.10			
Southdown	0.20	0.24	0.22	0.23	0.35	0.10			
Hampshire	0.24	0.33	0.27	0.24	0.35	0.10	0.45	0.38	0.36
Dorset	0.11	0.27	0.29	0.27	0.27	0.09	0.46	0.38	
Meatlinec	0.22	0.34	0.30	0.31	0.50	0.12	0.30	0.30	0.40
Charollais	0.22	0.38	0.30	0.34	0.35	0.10	0.46	0.38	0.36
Suffolk	0.21	0.31	0.32	0.35	0.35	0.10	0.46	0.40	0.40
Texel	0.25	0.41	0.29	0.38	0.35	0.10	0.43	0.32	0.30

Research to date

Genetic parameters have been reviewed

- Changes will have an impact on EBVs
- Final round of discussion

Models to look at heterosis and genetic groups are being tested

Methodology & milestones

(Update November 2015)

- An accurate knowledge of breed make-up (PEB).
- Assess the data structure to ascertain numbers of pures/crosses.
- Produce a test extraction from the database.
- Technical issues specific to the BLUP run will include:-
 - Determine the best way to account for heterosis
 - Determine which genetic parameters to use
 - What scaling is required to ensure fairness across the breeds.
 - Develop appropriate genetic group structures.
- Develop the evaluation to produce EBVs
- Produce systems to report EBVs
- Extensively test the resulting EBVs
- Review indexes and make recommendations

Implementation

- Steady progress is being made
- Not enough time to implement and communicate for 2016
- Too important to rush



Combined Breed Analysis Implementation plan

- Four phases
 - Research (semi-completed) – 2015/16
 - Development – During 2016
 - Implementation – Starting 2017
 - Future research

Phase 1. Research (March – December 2015)

- Establish PEB (and publish on database)
- Finalise genetic parameters
- Finalise approach to handle heterosis
- Finalise genetic group solutions
- Propose index weightings for consultation

Phase 2. Development (January – December 2016)

Produce and publish within breed EBVs
Business as usual in 2016

- Consult with breeders on index weightings & outline implications of the change (Feb – Mar)
- Agree index weightings
- Establish a knowledge exchange strategy

Phase 2. Development

(From April 2016 - if we are ready)

EGENEs will run the CBA every month

Constant review: Genetic group solutions, General QA, Movement in EBVs etc

Signet may publish short summaries by breed of:

- Leading sires, lambs and shearlings as pdfs

- Reported on separate page of the Signet website

Test reporting software

Monitor data flow – bureau and technicians

Phase 2. Development

From November 2016 implement knowledge exchange strategy

“Start to tell folk about it”

Phase 3. Implementation

(January – December 2017)

- Major roll out of knowledge
 - Jan-March (pedigree messages)
 - April onwards (commercial messages)
- Publish CBA deadlines and publication dates
 - Breed Societies can plan catalogue publication
- Produce CBA from 1st January for all breeds and publish on BASCO
 - Overwriting all previous runs
 - New Summaries
 - New Benchmarks

Phase 3. Implementation

(January – December 2017)

CBA will then be run monthly (fortnightly in July, August and September)

- Provisional frequencies – to be discussed

Phase 4. New Research (Future)

Genomics

Feed Efficiency



New CT traits

Commercial data

New on-farm traits

Lamb survival / longevity work

The End



Who is included?

Breeds included

- Texel
- Suffolk
- Meatlinc
- Charollais
- Hampshire Down
- Beltex
- Blue Texel
- Blue Du Maine
- Vendeen
- Southdown
- Dorset
- Shropshire

Breeds for consideration:

- Berrichon and Ile de France
- Individual flocks with Composite, Meatlinc crossbred and Charollais cross data