

- COGENT GENETIC SERVICES -



**YOUR ULTIMATE  
BREEDING SERVICE**



[www.cogentuk.com](http://www.cogentuk.com)

# INDEX BREAKDOWN

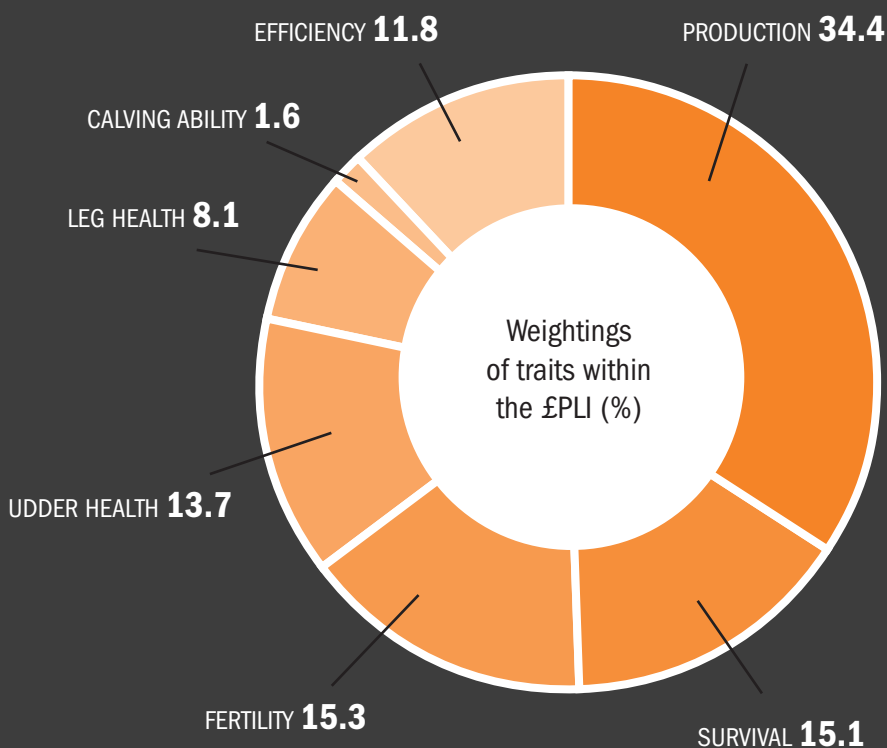
## WHAT IS A GENETIC INDEX?

A genetic index is a measure of an animal's ability to transmit its genes on to the next generation. These could be genes for production, for conformation, for a combination of the two, or for any other heritable trait that can be measured. It is important to understand that a genetic index is not a measure of a physical trait in an animal, which is technically known as its phenotype (e.g. coat colour, stature, milk production etc), but is a reflection of its genotype (i.e. its genetic make-up). This distinction is important to understand, since many cows could produce high quantities of milk, but their high production may be more a function of their management regime than their genotype. A genetic index therefore makes the best estimate possible of an animal's ability to transmit a quality, by discounting the effects of its management regime and other environmental factors.

## DID YOU KNOW

Cogent offers a wide range of genetics across each Index to suit farm specific selection criteria

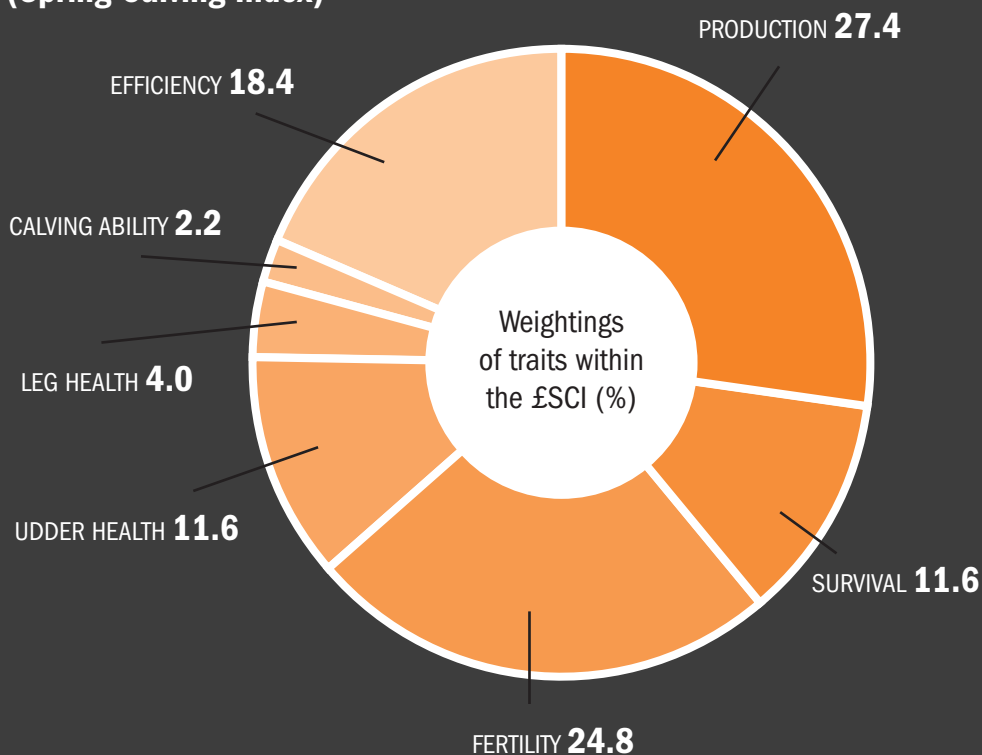
## PLI (Profitable Lifetime Index)



- ▶ Comprising of multiple traits which is weighted relative to its economic importance
- ▶ Suited for use in year-round-calving (YRC)
- ▶ Within breed selection
- ▶ Represents the additional profit that a daughter of a high £PLI sire is expected to earn over her lifetime, compared to a daughter of a sire with a £PLI of 0

# SCI

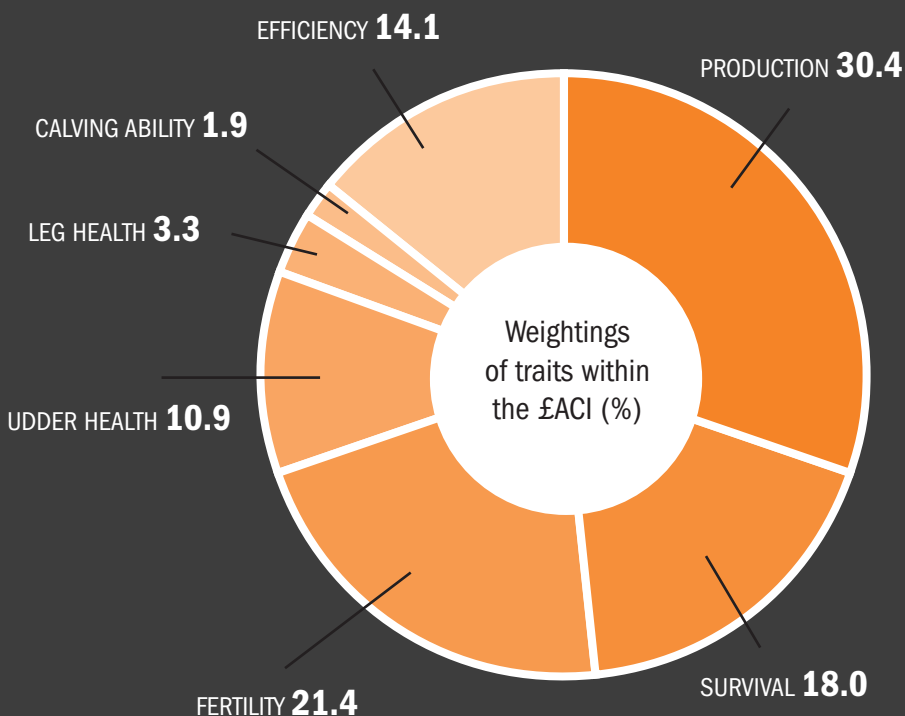
(Spring Calving Index)



- ▶ Across-breed genetic index developed specifically for spring block-calving herds
- ▶ Reflects lower volumes of Milk, however at a higher quality
- ▶ Large emphasis on Fertility and Calving Ease
- ▶ Favours sires that will produce a smaller cow with lower maintenance requirements
- ▶ Suitable to compare sires represented by different breeds

# ACI

(Autumn Calving Index)



- ▶ Suited for autumn block-calving herds
- ▶ Reflects cost associated with winter production feeding and higher milk price/litre expected such time of the year
- ▶ Greater emphasis on Milk, less weight on Fat and Protein %
- ▶ Slightly greater weighting on female fertility than £PLI
- ▶ Suitable to compare sires represented by different breeds



# PRECISION DNA

## BRINGING GENOMICS TO LIFE...

### PRECISION DNA PROVIDES THE ULTIMATE IN FEMALE GENOMIC TESTING FOR DAIRY FARMERS

Our PrecisionDNA portal allows customers the opportunity to view and interact with their Genomic results, making the decision making a tangible experience. Here customers can, with the guidance of their Cogent Genetic Consultant, select or deselect, rank and view female rankings relative to an extensive range of traits and indices custom to their on-farm breeding objectives. This ultimately enables customers to identify the females they would like to breed their future female generation from, and also manage all negatively associated markers and haplotypes for increased performance, profitability and genetic gain.



### PRECISIONDNA MOBILE APP

This Android mobile application enables customers to perform a quick cow-side search should they like to validate decision making in real-time, whereby the genetic merit of females can be viewed and searched on an individual cow basis. This allow for increased reliability and accuracy of decision making with a comprehensive, however simplified way of viewing genomic evaluations.

# THE FEATURES

## STATE OF THE ART

Fully interactive customer Genomic Data portal to simplify the genomic selection process

## EXPANDED TRAIT SELECTION

PrecisionDNA captures multiple Indices, traits, Haplotypes and Marker information

## BESPOKE

Designed to address individual on-farm specific needs and wants in real-time, delivered by a dedicated Genetic Consultant

## FUTURE PROOF

Track generational genetic progress at identified trait level, minimise risk and improve overall profitability

# YOUR BENEFITS

## CUSTOM DESIGN

Select and de-select the desired female population, view daughter specific performance and track generational progress.

## ACCURACY AND RELIABILITY OF SELECTION

Increased reliability in decision making, resulting in improved accuracy of selection. Parentage verification and subsequent correction

## SELECTION

Rank all genomic females on the £CCI (Cogent Custom Index) in order to maximise both on-farm profitability and overall genetic gain. Categorise and rank females subject to individual farm breeding objectives and goals

## REDUCE COSTS

Identify designated Ecofeed females, prevent carrier matings from negatively associated Haplotypes and Recessives, continuously select and breed from the highest genetic merit female population, manage heifer inventory by not rearing or breeding from inferior genetics.

## DID YOU KNOW

Cogent has a dedicated team of Genetic Consultants delivering a personalised service making use of a fully interactive Genomics and Genetic Selection Portal, tailored to customer specific needs, wants and on-farm goals with profitability at the forefront of decision making.



# UNDERSTANDING MARKERS

## OUR MARKER PACKAGE IS THE BEST VALUE OFFERING IN THE DAIRY INDUSTRY

### HAPLOTYPE INHERITANCE

If both parents are carriers of an undesirable haplotype (HH5):

**There is a 25% chance that there will be an affected offspring that would not survive to birth**

**Of the live offspring, one-third will be unaffected non-carriers and two-thirds will be carriers**

#### Milk Proteins

Kappa Casein  
Beta Casein A2  
Beta Casein AB  
Beta Lactoglobulin

#### Genetic Abnormalities

BLAD / DUMPS /  
CVM / Brachyspina Citrullinemia /  
Fishy Off Flavor / SDM / SMA HCD  
/ JH1 / HH1 / HH3 / HH4 / HH5 /  
HH6 / BH2 / AH1

#### Others

DGAT  
Dominant Red  


Haplotype Name	Gene	Effect	When
HH1	APAF1	Spontaneous Abortions	All stages of pregnancy
HH2	UN-KNOWN	Pregnancy loss	Before day 100
HH3	SMC2	Pregnancy loss	Before day 60
HH4	GART	Impacts production of purines	Early embryonic death
HH5	TFB1M	Pregnancy loss	Before day 60
HH6	SDE2	Pregnancy loss	Before day 35
HCD	APOB	Inability to produce cholesterol	Death typically between 2-6 months of age due to starvation
JH1	CWC15	Pregnancy loss	Before day 60
BH2	TUBD1	Stillborn calf	At birth
AH1	UBE38	PIRM Syndrome	Development impacts at birth; Juvenile mortality

# UNDERSTANDING TRAIT HERITABILITY

## PRODUCTION TRAITS

- ✓ Milk (55%)
- ✓ Fat (68%)
- ✓ Fat % (68%)
- ✓ Protein (68%)
- ✓ Protein % (68%)

## HEALTH, WELFARE AND FITNESS TRAITS

- ✓ Somatic cell count (11%)
- ✓ Mastitis (4%)
- ✓ Fertility index (3%)
- ✓ Lifespan (6%)
- ✓ Calf survival (5%)
- ✓ Locomotion (10%)
- ✓ Lameness advantage (4%)
- ✓ TB advantage (8%)



## TYPE TRAITS

- ✓ Linear type
- ✓ Composite type
- ✓ Feet & Legs (16%)
- ✓ Udder (27%)
- ✓ Type merit / Type score (32%)

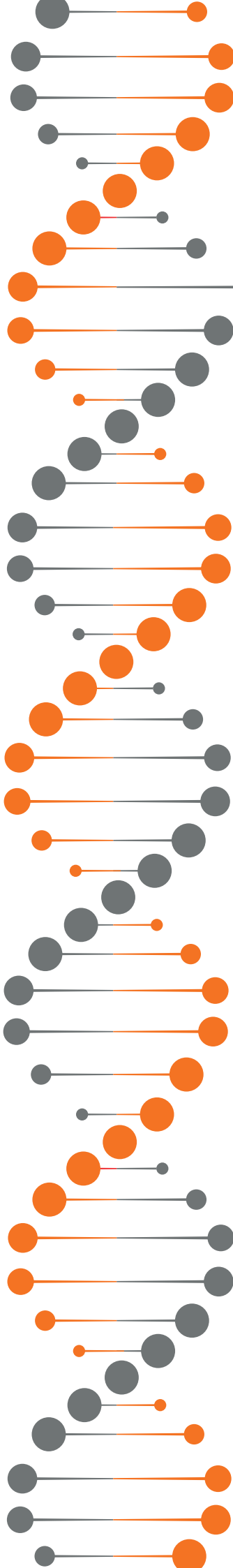
## MANAGEMENT TRAITS

- ✓ Temperament (11%)
- ✓ Ease of milking (21%)
- ✓ Calving ease (7%)
- ✓ Maintenance
- ✓ Dairy carcass index (40%)

**EcoFeed**  
(21%)

## DID YOU KNOW

Cogent has on offer a wide range of both Dairy & Beef Genetics across multiple breeds to suit all UK production practices and associated breeding objectives.



# GENOMIC TESTING

USING GENOMIC RESULTS IS  
**30%**  
MORE RELIABLE THAN USING PARENT AVERAGES ON HEIFER REPLACEMENTS

The primary benefit of genomic testing is driving an increase in genetic gain, and thus the genetic value of a herd. The effect of genomics on genetic gain can be demonstrated using a simplified version of the 'Breeder's Equation' given by Falconer and Mackay (1996).

$$R = i \sigma_A r$$

- R = Response to Selection.**  
Otherwise known as genetic gain. How much better is the next generation of animals than what is already in the herd?
- i = Intensity of Selection.**  
How high do we set the threshold below which animal aren't selected?
- $\sigma_A$  = Genetic Standard Deviation.**  
What is the spread of genetics within the group to be selected from?
- r = Reliability.**  
How reliable are the figures upon which we select animals?

BREEDING AND GENETICS SIMULATION			
	CONVENTIONAL + BEEF	SEXED + BEEF	SEXED + BEEF + GENOMICS
Genetic variance (Milk kgs)	249	249	249
Selection intensity coefficient	0.227	0.83	0.83
Accuracy (Square root of reliability)	0.5	0.5	0.81
RESPONSE / GENERATION (Milk kgs PTA)	28.2615	103.335	167.4027





## UK PRODUCT RANGE

GENOMIC TESTING PROVIDED BY  
**Genetic Visions-ST™**

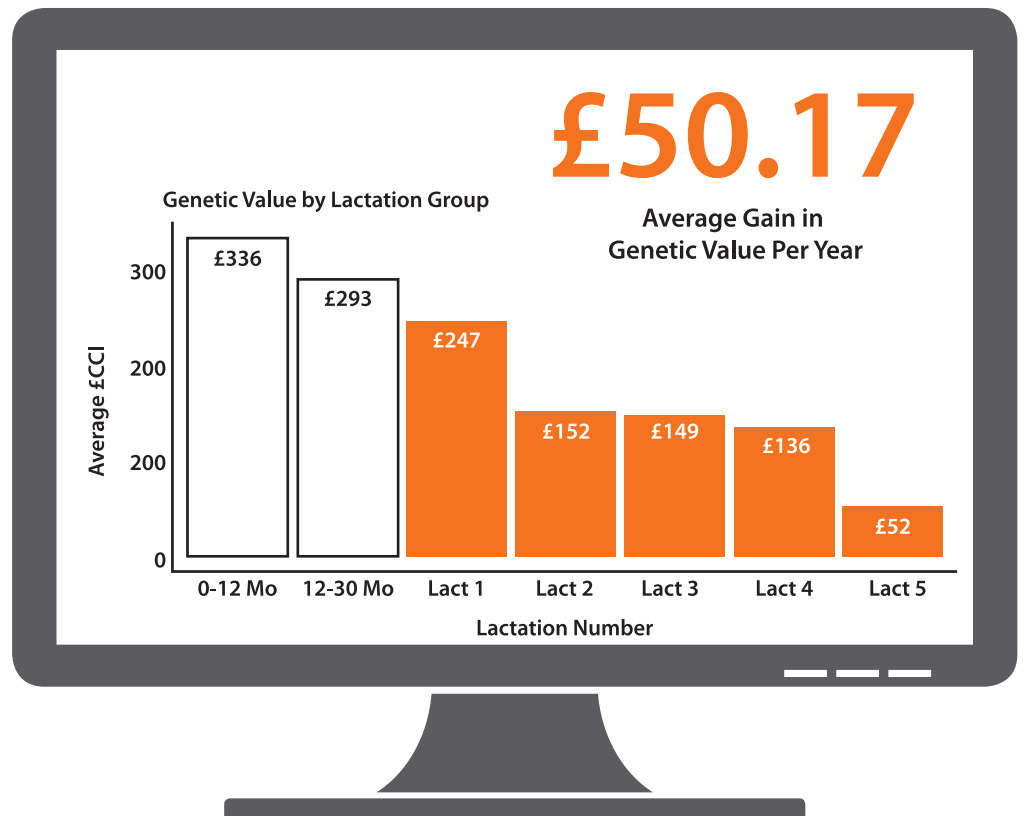
PRODUCT FEATURES & BENEFITS	PrecisionDNA (UK)	PrecisionDNA (US)
Genomic Values provided by AHDB/CDCB	AHDB	**CDCB
Number of traits *	45	75
Production	5	7
Health & Longevity	8	20 (+ Disease Resistance Traits)
Conformation	19	22
Selection Indices	£PLI	TPI/\$NM
Milk Markers	Kappa Casein Beta Casein A2 Beta Casein AB Beta Lactoglobulin	Kappa Casein Beta Casein A2 Beta Casein AB Beta Lactoglobulin
Markers Package	✓	18
Ecofeed	✓	✓
Parentage Discovery	✓	✓
Chromosomal Mating	✓	✓
*Number of traits are breed dependant		**Council on Dairy Cattle Breeding

### DID YOU KNOW

Cogent offers a wide array of Genomic Testing Products, including an extensive range of Genetic Markers and Haplotypes to allow for increased accuracy of selection and reliability in overall genetic decision making, including official CDCB evaluations with a variety of additional Health Traits and Indices.

# PRECISION MAP

CONTAINING A BREEDING TOOL THAT INCLUDES BOTH DAIRY AND BEEF SIRES, AS WELL AS FEMALE SELECTION IN ORDER TO MAXIMISE ON-FARM PROFITABILITY AND GENETIC PROGRESS.



PrecisionMAP offers an extensive data analysis of each individual cows performance, benchmarked against the farms actual milk contract.

Precision MAP Comprises of the below, all on a herd specific basis.

- Animal performance summary
- Sire performance summary
- Production traits
- Health and fertility
- Functionality
- Ultimate breeding strategy
- Financial return
- Sire selector
- Animal selector

Ensure every cow reaches its potential.

“The PrecisionMAP tool looks at the requirements of our Arla/Tesco milk contract, combined with each cow’s performance and conformation data, allowing me to identify genetic trends and therefore areas of genetic gain within my herd.”

**RODNEY DOWN**  
Higher Wrantage Farm



## DID YOU KNOW

PrecisionMAP captures an extensive range of current UK Milk contracts to ensure we offer bespoke genetic advice and solutions with customers’ profitability in mind.



# PRECISION MATCH

New product updates includes **Chromosomal Mating**, an innovative breeding function utilising actual female and male genomic relationships for increased, reliable decision making and more effective management of individual animal inbreeding

## ▶ **MAKE YOUR OWN CHOICE**

PrecisionMATCH is tailor made to reach individual breeding goals, there are no default settings. Production, health and conformation parameters are set to suit you so that every mating produces the ideal type of cow for your farm requirements. Herds are enhanced both physically and financially with weaknesses in cows reduced by careful matching with strengths in sires. Our team of dedicated, highly-trained evaluators are equipped with know-how unrivalled in the industry, backed by years of practical experience working with cows.

## ▶ **UK FIGURES**

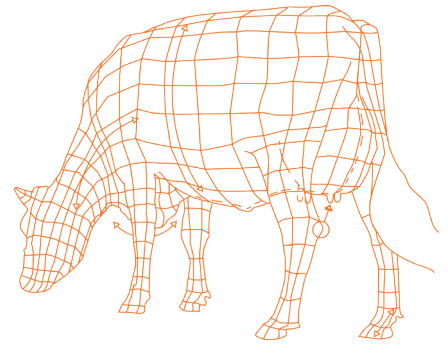
PrecisionMATCH evaluators base their assessment and mating choices on UK figures to actively manage genetic recessives, minimise inbreeding and produce more profitable cows, making the PrecisionMATCH programme more accurate, reliable and consistent for herds.

## ▶ **18 KEY TRAITS SCORED**

With PrecisionMATCH each cow is scored against 18 key type traits. Unlike other mating programmes, PrecisionMATCH, scores locomotion, which is an animal's ability to walk with fluid movement and have full flexibility on Thurl, Hock and Pastern. Locomotion also takes into account the animals length of gait and if cow movement is anti gait. Locomotion is the only trait that is directly correlated to the lifetime yield of an animal and its ability to walk.

The difference in lifetime yield between an animal scoring 1 and a animal scoring 9 is 17,000 litres.

# OUR EXTENDED MATING FEATURE THAT WILL REVOLUTIONISE THE GENETICS MARKET.



## CHROMOSOMAL MATING

### 1. LINEAR MATINGS

Easy to use app providing real-time data for optimisation of mating's that enables farmers to score their animals.

### 2. PEDIGREE BASED MATINGS

Estimate expected progeny performance based on parent averages.

### 3. GENOMIC MATINGS

Optimise the use and dissemination of the best genes in the new generation.

## What makes Chromosomal Mating different?

The goal of Chromosomal Mating is to optimise an economic trait while accounting for inbreeding depression.



Mating results will be calculated to increase the selected economic trait to the greatest potential for a specific group of females and bull team selected.



Programme does not maximise each mating, but optimises mating's for the entire herd.

Discover how to successfully combine your heifers and cows with the strongest bull line up in the world.

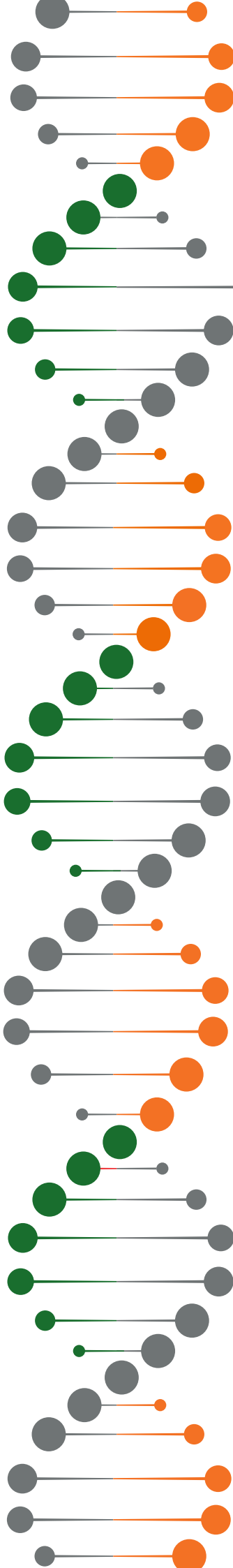
Access additional genomic information for your herd

Maximise genomic breeding values in your offspring

Manage future inbreeding and achieve genetic gain

Control the number of mating's for each bull

**IDENTIFIES THE WEAKEST TRAITS AND SELECTS THE IDEAL SIRE TO CORRECT THOSE TRAITS**



# ECO FEED

HIGH ECOFEED HEIFERS CAN CONSUME UP TO 24% LESS FEED PER DAY (4.7KG/DAY AS FED)

## SUSTAINABILITY WITH LESS COST AND MORE SENSE

To create a sustainable future, the dairy industry must work to increase production with fewer inputs, while simultaneously working to reduce their environmental impact. Feed represents the largest variable input cost of production, accounting for up to 50% of total production costs, and is related to enteric methane emissions. This means that the greatest potential to improve profitability and environmental sustainability is to improve the ability of dairy cattle to efficiently convert feed into consumer products.



Feed costs represents between 37-50% of the total milk price received on UK dairy farms



Efficient feed conversion by dairy cattle has a direct impact on the animal's carbon footprint



The dairy industry must work to increase production with fewer inputs



2 billion more mouths to feed by 2050

### HOW DO WE DEFINE FEED CONVERSION EFFICIENCY?



The Ecofeed program utilises a measure of Feed Conversion Efficiency (FCE) known as Residual Feed Intake.

RFI is a measure that quantifies the variation in feed intake beyond needed for maintenance and performance requirements

- RFI is independent from body size and production
- Can be used in multi-trait selection indexes to simultaneously improve both feed conversion efficiency and other economically important traits.

This makes RFI an ideal trait for the Ecofeed index as STgenetics strive to create a future in which dairy cattle achieve increased outputs with fewer inputs, providing farmers with the economical and environmental sustainability for long term success.

# WHAT IS



EcoFeed is a feed conversion index based on information from over 5000 female progeny born from over 700 sires. Animals are tested between 200 - 400 days of age, with feed intake, performance and feeding behaviour traits being measured for a minimum of 70 days.

The RFI value calculated for each female is the difference between actual and expected feed intake (based on body size and performance). A bull's EcoFeed value is determined from the growing heifer RFI values of his daughters.

The average, or base, of the population is 100, with each 10 points above 100 equating to 0.45kg less feed (as fed) that the bull's progeny can expect to consume each day whilst maintaining production.

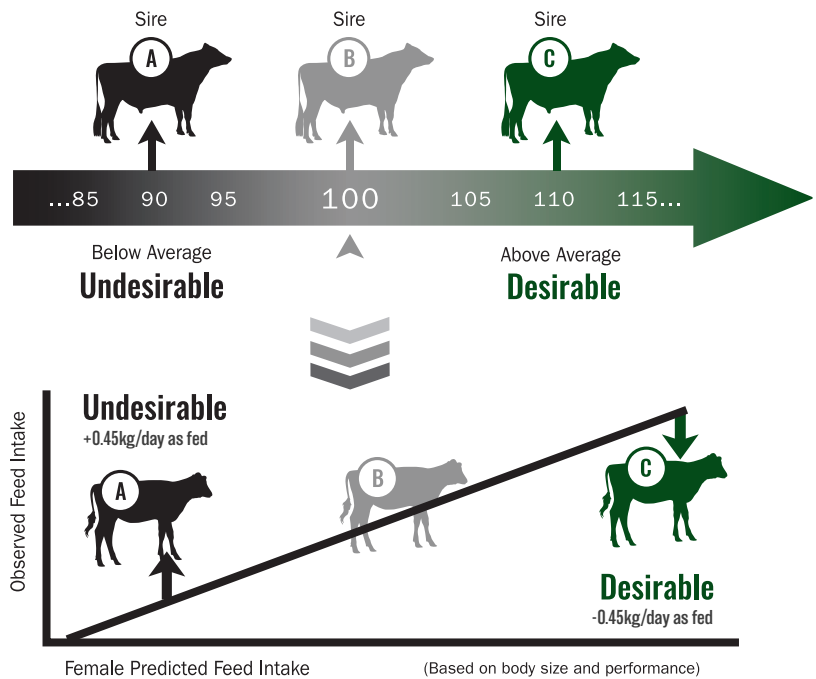


Figure 1. Female A consumed 0.45kg more feed (as fed) per day than expected based on her body size and performance and has a sire with an EcoFeed® score of 90. Female B consumed the predicted amount of feed per day based on body size and performance and has a sire with an EcoFeed® score of 100. Female C consumed 0.45kg less feed (as fed) per day and has a sire with an EcoFeed® score of 110.

When selecting for high EcoFeed heifers in combination with other economically important traits, you can expect to save on feed costs while maintaining body weight and average daily gain.

EcoFeed values are presented as a Breeding Value (BV), therefore a female with an EcoFeed value of 110 will consume 0.90kg less feed per day (as fed) than her contemporaries. In order to determine what she is expected to transmit (PTA), divide the BV by 2.

Heifer A will consume on average 0.90kg more feed per day (as fed) than her contemporaries which translate to £19.71/kg as fed/pa. Heifer B will consume 1.8kg less feed per day (as fed) than Heifer A, resulting in annual savings of £32.85/kg as fed/pa. For a 200 cow dairy rearing 60 heifers (30% Replacement Rate) this could translate into savings of £2365.20/pa as fed fresh feed.

Heifer A  
EcoFeed® Index: 90



**Feed Intake:** 0.90kg more feed/day as fed than contemporaries

**Feed Cost:** 6p/kg fresh feed as fed

**Additional cost per year:** £19.71

Heifer B  
EcoFeed® Index: 110



**Feed Intake:** 1.8kg less feed/day as fed than Heifer A

**Feed Cost:** 6p/kg fresh feed as fed

**Savings per year:** £39.42



All females can receive an EcoFeed value when genomically tested with Cogent PrecisionDNA and **Genetic Visions-ST™**

## - COGENT GENETIC SERVICES -



With Cogent's PrecisionMATCH mating programme being used to score cows on individual traits, match corrective linear and avoid in-breeding or the introduction of recessive genes. The Westcott herd now averages exceptional components plus improved overall Type.

**Darren Furse,  
Westcott Farm**



PrecisionDNA is definitely the way forward. It ensures the best animals within the herd are accurately defined, allowing more informed breeding decisions to be made - it should save us money in the long term.

**Paul Ingham,  
Laneside Farm**



PrecisionMATCH has already meant I have bred the lower genetic merit heifers to beef, which I would probably have blanket served to sexed female dairy without the genomic testing service.

**Kenny Campbell,  
Slagnaw Farm**



PrecisionMAP has been a useful tool for us. We plug in our milk contract - a liquid contract with M&S - and we look at our genetic profile on a dashboard and identify areas for improvement. Of course, we want all of the usual traits including better feet, legs and udders, but we also want to improve the uniformity across the herd.

**Tim Lock,  
Bury Manor Farm**



We are being more precise with breeding. Having done genomic testing and having the confidence in the semen means we have the confidence to use it on cows and we know they will hold on first and second lactation cows.

**Ed and Bethan William,  
Beacon Farm**



We can now more closely analyse or highlight the best animal in the context of our breeding aims and breed the best. Our breeding goals haven't changed, just the ability to achieve those targets more quickly

**Trevor Lloyd,  
Ty Mawr Farm**

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