

“The 2021 Semex Conference is themed “Boldly Go”. In light of the changes facing the UK dairy industry what steps should be taken at farm level to adapt to these changes and boldly go forward?”

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In recent years there has been many changes facing the UK’s Dairy industry. From increasing costs to uncertain markets due to Brexit and corona virus to increasing veganism and the strain on public image. UK dairy farming is being put under increasing strain and pressure. To boldly go forward and face each challenge dairy farmers need to ensure they can meet these changes. The UK dairy industry needs to be Bold when making decisions.

Breeding is a major way that farmers can face these challenges. Genomics was introduced to the UK 11 years ago in 2009. This is a vital tool for many dairy farms throughout the country and indeed worldwide, which have reaped the benefits of this technology. Genomics is the information gained when the DNA of an individual is measured. There are over 3 billion pairs of bovine genomes decoded. Primarily genomics was introduced to provide a means of aiding farmers to select bulls for use across their herds. The PLI weighting in UK provides a great selection and the current PLI breakdown can be shown on Figure 1. As time has went by, more and more emphasis are being placed on genomic testing females, to gain knowledge into their breeding potential, alongside the males.

Figure 1: PLI Breakdown

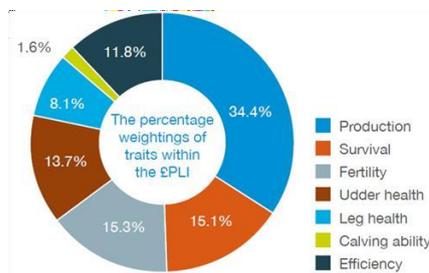
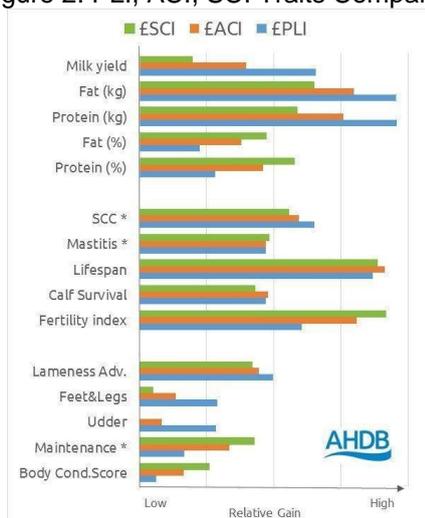


Figure 2: PLI, ACI, SCI Traits Compared



The £PLI value represents the additional profit a high £PLI bull is expected to return from each of its milking daughters over her lifetime compared with an average bull of £0 PLI within a certain breed all year-round calving. £PLI reflects the latest UK market and farming conditions.

There are three economic rankings

- £PLI – Profitable Lifetime Index for All-year-round calving herds
- £ACI – Autumn Calving Index for Autumn block-calving herds
- £SCI – Spring Calving Index for Spring block-calving herds

Figure 2 shows the different emphasis on certain traits for each ranking. For example spring block calving herds, require higher milk solids and lower volumes of milk, compared with either an autumn block calving, or all year round calving herd. So SCI allows for this in its calculation.

The Fertility Index is more important for block-calving herds compared with an all year-round calving herd, so SCI and ACI give more value to this than PLI. Genomic testing has allowed mastitis, lifespan and lameness index’s to be created which all three systems give a strong weighting.

Genomic testing heifers provides owners with the ability to make management decisions as well as breeding decisions. An American Study found the Cost of rearing replacements is between 15-20% of overall production costs. Costing between \$1533-\$2628/heifer. Meaning Genomic testing heifers can help to minimize profit costs by more reliable animal selection to result in a more efficient profitable herd. Heifers with an exceptionally high GPA for production can be used as donor dams for high genetic embryos to be implanted into lower genetic females.

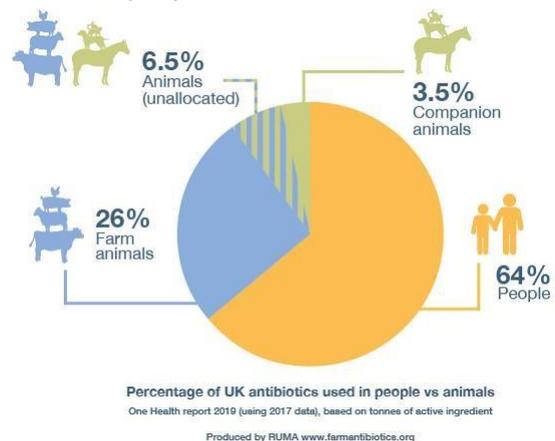
Teaming sexed semen with genomic testing heifers allows farmers to produce more females from their most superior animals. New technology Sexed Semen conception rate is now 87% of the rate of conventional semen. It therefore is being used more and more. This increase in usage means there are more heifers coming into the herd year on year as replacements. This means a reduced bio security risk as less replacements will have to be bought in but also gives you the second benefit of the opportunity to sell of your heifers who won’t perform as well which will bring in more cash flow and leaving the best genetics in the milking herd. In Australia the female genomic testing herds such as Emu Banks export the lower genetic value heifers to China. By genomic testing your heifers you can select your best heifers and pair them to sexed semen to ensure heifer calves. Lower genetic females could also be breed to beef sires this will help to create another revenue for farmers. The increased

number of Heifer calves also will reduce the number of bull calves being exported from the UK which would increase the dairy industries public image around live calf exports and bull calf policies.

A TB advantage index was introduced that would help UK dairy farmers breed cows with an improved resistance against bovine tuberculosis (bTB). TB Advantage can be used as part of a range of important genetic traits to form a balanced breeding plan for the herd. The degree of emphasis on the TB Advantage may further depend on whether the herd is within or close to a bTB affected area or not. Due to the increase in bTB rates within the UK, TB advantage merit is gaining more and more emphasis when breeding. Clearing the UK of bTB would have major positive economic impacts on the UK livestock industry, opening up movements and potential markets between the EU and further afield and reducing the compensation payments which have totaled over £500 million over the last decade.

There has been increasing empathies put on farmers to reduce antibiotic usage, especially in the dairy industry. Semex introduced Immunity Plus sires, offspring from these sires will have reduced cases of mastitis, metritis, pneumonia, dermatitis and johnes. This would allow farmers to breed for a stronger healthy herd. The immunity rates of immunity plus sires are passed from parents to progeny at rates of 30%. Semex's groundbreaking immunity plus sires will allow farmers to breed offspring which is more disease resistance that will respond better to vaccines, give better colostrum and live longer. Diseases cost farmers hundreds of pounds to treat. The total cost of severe mastitis per affected cow per year is calculated at £435.8. The total cost of losing a fatal case of mastitis is about £1251 for the loss of the cow and £167 for the veterinarian's intervention, making a total loss of £1418. Figure 3 shows 26% of the UK's antibiotic use is on farmed animals, by reducing these diseases they will also reduce the amount of antibiotics being used to treat them and therefore help to reduce antibiotic resistance. Therefore, making them easier to treat with first- and second-generation antibiotics. Immunity Plus helps to create a more profitable herd but also a healthier herd and a Healthy herd is a happy herd.

Figure 3: Percentage of UK Antibiotics used in people and Animals.



Dairy cooperatives pay premiums for milk with a low Somatic Cell Count (SCC), High Butter Fat % and Protein %. Breeding for milk components will increase profits and suit market requirements. The SCC index will help to provide information on what sires will help to keep SCC's down. Many milk processors are considering paying suppliers for kg of milk instead of litres to ensure more emphasis is put on quality over quantity.

Due to Brexit and Covid-19 the UK may have to find new markets which milk can be supplied to. Australia and New Zealand supply a large amount of milk market to Asian Countries. The Beta Casein Gene influences the production of A1 or A2 milk protein casein. A2 milk is a lot easier to digest especially for the population of Asian Countries. This has seen not only a massive increase in the emphasis of A2A2 sires being used but also the demand for sires to be entering the semen market. Milk Processors such as Fonterra will soon only accept A2A2 milk. Farmers will be able to know through genomic testing the heifers which ones are A1A1, A1A2 or A2A2. Therefore only breeding from A2A2 heifers to A2A2 sires to ensure they are breeding future offspring that will meet these milk demands. There is a milk and tissue test also available for A2A2 genes, however the animal will have had to already have a calf and be in the milking herd to use the milk test. 30% of cows in New Zealand now produce milk that only has A2 beta Casein. Some markets are paying more for A2 milk and it is believed there are some health benefits to A2A2 milk such as reduced type 1 diabetes and heart disease. Breeding for A2 Beta Casein may open new markets or the UK dairy industry.

Genomics and breeding will help to breed not only from your most profitable cattle but also breed more profitable animals to meet the future market requirements. Using PLI and breeding to create an easily maintained, average sized cow with good production that will go easily back in calf. Reducing antibiotic resistance and costs by using immunity plus sires to help to create an easily managed and maintained herd. Reducing rearing costs and improve herd genetic value with sexed semen. I feel breeders should always be working towards what the market requires and the demand for A2 beta casein milk.

To Boldly go forward the UK Dairy industry needs to be Bold, putting major emphasis on '**Breeding**' for the '**Opportunity**' of future markets to ensure the '**Lifetime**' of the Industry and with this and '**Determination**' they will succeed!