

GeneMark® Genomics-FAQ's

When will GeneMark Genomics be available?

Customers can sign up for GeneMark Genomics from February 2024. All samples processed will continue to receive parentage within 4 weeks and the results of Genomic Evaluation (GEV) will be first released in August 2024.

What is a genomic evaluation?

Genomics is the study of genes and how those genes are expressed. Genes of interest in dairy cows can include those that control key traits such as fat and protein production, liveweight, fertility, and others.

Genomic evaluation adds an animal's own DNA to its evaluation to better estimate those traits of interest. The improved estimation of traits is reflected in higher reliability figures. The higher the reliability, the closer the breeding value is to the animal's true genetic merit. Genomic evaluation is available for female animals only.

What is a genotype?

Genotypes are genetic markers that can be used to generate a DNA profile for an animal, and be used in parent verification as well as included within LIC's genomic evaluation model.

Why is GeneMark Genomics an improvement from the current GeneMark service in terms of animal evaluation?

GeneMark Genomics now adds an extra layer of accuracy when estimating an animals breeding worth by including the animals own DNA as well as ancestry information into the evaluation model. With genomics the reliability of an animals' breeding value lifts to around 45-55%. This is much higher than a parent average alone (around 30-35% reliability). The higher the reliability, the closer the breeding value is to the animal's true genetic merit.

What is the value of genotyping my animal(s)?

By genotyping your animals, you will receive more information about their genetic merit from an earlier age. Genomic evaluation can help improve decision making for the culling and breeding of your animals both now and in the future, enabling you to breed the best animals for your herd, faster.

How do I identify if an animal has had a genotype included in its evaluation?

Animals will have a 'GEV' icon in MINDA  and often a higher reliability.

Will the genomic evaluation service be valuable if I haven't completed parent verification for my herd?

Yes, every animal that receives genomic evaluation will be tested for DNA parentage. If no parents are found, the animal's own genotype is used in its genomic evaluation. If no parents are found the reliability will be around 25-30% as opposed to 45-55% if both parents were found.

Can you provide genomic evaluations for all dairy breeds?

Yes, however, breeds that are not well-represented in the LIC Dairy Reference population will have reduced accuracy in their estimated breeding values.

Does LIC's genomic evaluation service work with overseas genetics?

LIC's genomic evaluation service works best for animals closely related to the New Zealand national herd. For international herds with significant amounts of New Zealand genetics we will deliver a reliable estimate of genetic merit assuming a similar farm system to New Zealand. However, animals that are genetically different from the New Zealand dairy population or have a significantly different farm system environment will have reduced accuracy in their estimated breeding values.

Pricing and booking information

How much will GeneMark Genomics cost?

The price you pay depends on the time of year you send in your samples for GeneMark Genomic testing.

Off peak youngstock (January – August): \$29.99 per sample

On peak youngstock (September + December): \$32.99 per sample

Off peak Dams/sires: \$19.99 *

*Sires will receive parentage only

Note: Dams/sires can only be processed during the off peak timeframe.

I don't need GEV - can I arrange to sample my animals for DNA parentage only?

With the introduction of GeneMark Genomics, LIC's DNA parentage and genomic evaluation services have been combined into one single, convenient product, giving you DNA parent verification and genomic evaluation results for every eligible female animal sample you send to us. DNA parentage sampling alone, will no longer be available for female animal samples.

Natural mating sires can be booked for DNA parentage sampling only, as genomic evaluation services are not available for these animals.

How can I book my herd in for GeneMark Genomics?

If you are an existing GeneMark Whole Herd customer, we will call you to confirm booking details. You will receive a confirmation email with all booking details in June/July.

If you are looking to use GeneMark, please reach out to your local Agri Manager and they will be happy to arrange this for you.

What if I have an off-peak booking but they arrive at GeneMark during the on-peak timeframe?

Prices are based on the date for which we receive your samples. Therefore, if your samples are booked for off peak but arrive to us during the on-peak season, on-peak pricing will apply.

Furthermore, if you have booked for on peak but we don't receive the samples until the off-peak season, you will be charged off-peak pricing.

I have already signed up for GeneMark Whole Herd, how can I transition to GeneMark Genomics?

If you have signed up for GeneMark Whole Herd and have processed your samples through GeneMark, you will automatically transition to GeneMark Genomics in June 2024. From June, all samples processed since February 2023 will automatically receive a genomic evaluation (GEv) at no additional cost and this will be updated in MINDA at the August GE run. All 2024-born calves will receive full parentage and a GEv at the new GeneMark Genomics pricing.

I have already done GEv on my calves this season why did I have to pay \$25 on top of my standard parentage fees?

The implementation of new technology in 2020 has allowed us to generate genotypes that can be included within LIC's genomic evaluation model. Since then, the technology and science has improved, enabling us to generate genotypes eligible for genomic evaluation at less cost and pass these savings onto our shareholders.

Sampling your animals

Do I need to continue to sample my dams when using GeneMark Genomics?

Although it is no longer a requirement to sample dams under GeneMark Genomics, we strongly encourage you to do so. Ancestry contributes to the reliability of an animal's breeding value and DNA verification ensures the ancestry is accurate.

Importantly, dam sampling also prevents inbreeding and ensures good record maintenance, which in turn, will bring significant benefit to your herd and the dairy sector. Dams sampled will have their own genomic information included in their genomic evaluations, providing a more accurate estimate of breeding values for dams.

Will I still be offered free on-farm support service when using GeneMark Genomics?

All new customers will still be entitled to a free on-farm support service to assist with sampling all animals (dams & youngstock) for the first three visits only. This also includes any record work that may need to be completed. Any subsequent visits will be charged at normal prices.

What is the difference between dam and youngstock samples when using GeneMark Genomics?

Samples from animals over 2 years of age are considered dams. Animals younger than 2 years of age are considered youngstock.

Getting your results

What is the turnaround time for youngstock and dam samples?

Results for GeneMark Genomics will be delivered in phases.

- Parentage for all samples will be delivered within four weeks from your lab booking date.
- We are aiming for a total estimated turnaround time for parentage and GEv results within 6 weeks for youngstock samples and 9 weeks for dam samples.
- There may be an extension to these turnaround times initially as we introduce this new product into our systems.

This season, GeneMark has delivered 95% of all parentage reports within four weeks and we commit to continually improving this turnaround time for you. For more information on expected turnaround times for GeneMark Genomics, visit our website.

Why is the turnaround time for dams' GEv longer than youngstock?

Under GeneMark Genomics youngstock will be processed through a new genomic evaluation process. Dams are unable to go through this new process as their herd test information needs to be included within the GEv run. This information can only be included during the full GE run completed monthly which results in an extended turnaround time.

Will dams and sires receive a parent verification report from GeneMark?

Yes, dams/sires will receive a parent verification report, and results will be emailed to you and uploaded to MINDA.

Will I get notified when my parentage results and GEv is available for dams?

Our GeneMark team will notify you once parentage results are completed, advising which GE run your animals will be included in. Once the GE run is complete you will receive an email notification on the following Monday that the genomic evaluations have been uploaded to MINDA.

If I sign up now, why won't I get my GEv results until August?

As we transition to the new GeneMark Genomics technology, that allows us to make genomic evaluations and parentage more widely available, there will be a significant influx of animal data entering our system. While this is something we expected, we want to take some more time to stress test our systems, processes and outputs before this data flows through to MINDA. Once this has been implemented, all samples processed since February 2023 will receive a genomic evaluation.

Now that I have my genomic evaluation service results, what can I do with the information?

There are two primary uses for genomic evaluation results:

- To determine replacement calves for your herd. - Selecting your replacements using gBW information will result in a better group of replacement animals (higher genetic merit) than choosing the same number of calves using only parent average information.
- To obtain more reliable breeding values for your animals and make more informed breeding decisions for your herd. It's important to note that although an animal has a high gBW reliability of 45-55%, gBW movement may still be seen at an individual level as additional information is included.

Animal indices and gBW

How much can farmers expect their animals gBW to move after receiving a genomic evaluation?

An animal's gBW or BW can move up or down. Below is an indication of the expected range in movement in gBW from using GeneMark Genomics:

68% of animals are expected to change by between +60 and -60 gBW

95% of animals are expected to change by between +120 and -120 gBW

Will DIGAD and LIC have differing BW information?

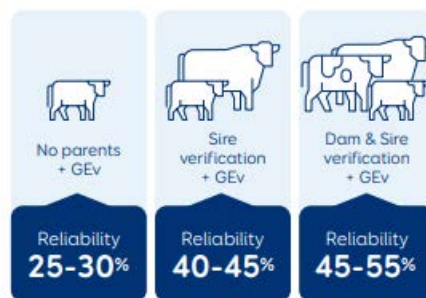
Yes, NZAEL and LIC will produce different BW results. LIC evaluations include genomic information whereas, NZAEL's evaluations do not. Sires with large number of progeny will have similar BW values.

After my animals have been given a genomic evaluation, will their old evaluations be available in MINDA so I can compare results?

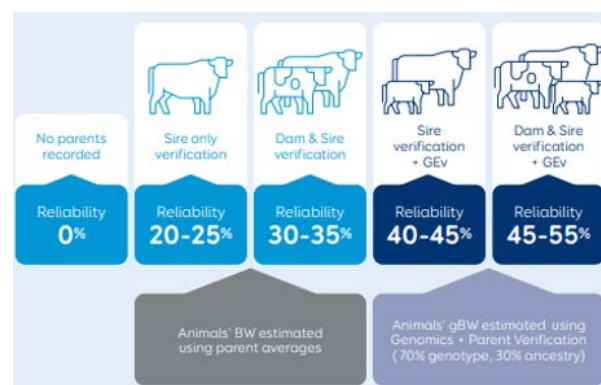
No, the updated genomic evaluations (BVs, BW, PW, and reliability) will override earlier evaluations. However, your genomic evaluation report will display pre and post breeding values.

If an animal does not match to any parents, what is the expected increase in gBW reliability once the animal's genotype has been included in the genomic evaluation?

Below is the expected reliability percentage you can expect to see for each scenario. The estimates will vary on a case-by-case basis but should provide a good approximation:



What is the average reliability for parent average vs genomic evaluation?



My calves have the same sire and dam but different gBW, how can this be?

If the calves are both genotyped and are non-identical twins, then their gBW will be different depending on the random sample of genes received from sire and dam. If the calves are identical twins, then their gBW will be the same across both twins as they'll both have inherited identical genes.