
NHIA News

Herd Improvement Newsletter

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Genomic Selection

This month, we have seen the public release of information regarding Genomic Selection from CRC/Genetics Australia and from Holland Genetics.

Genomic selection will affect the herd improvement landscape in a number of ways.

A major effect will be the way progeny test programs will operate. Genomic selection enables bull companies to screen candidates with an estimated 80% accuracy. In this way, dud bulls can be dropped from the PT program. This may result in less bulls being tested, but will also increase the value of PT semen.

Farmers will be happier to pay for the newest bulls if they could be more confident that the semen they used was going to improve their herd. Currently, some PT bulls may create drag on genetic improvement.

Another potential benefit from genomic selection will be the way contract matings are arranged. With detailed information on the dam's genome, the sire can be selected with greater confidence to produce genetically superior offspring.

In addition, selection pressure can be greater. The technology exists to harvest a single cell from 16 cell fertilised eggs (embryos) and screen the genome of each. The bull company can choose only those embryos that are likely to be elite.

In practice however, farmers are likely to breed all embryos as there will be demand for the offspring, given that the parents were selected from their genomic makeup.

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Nitrogen Safety Snippet

Nitrogen Safety is the responsibility of all staff and managers in herd improvement firms. Handling liquid nitrogen presents a number of risks that staff must constantly be vigilant in managing.

In addition to the safety information available in the NHIA Semen and Embryo Handlers Code of Practice, NHIA has numerous copies of the WorkSafe Victoria Code of Practice for Manual Handling. NHIA also recommends each business acquire and review the Australian Standard for "The storage and handling of non-flammable cryogenic and refrigerated liquids", AS1984-1997.

One obvious risk with liquid nitrogen is the risk of cold burns and frostbite where liquid or cold vapor contacts the skin and causes the skin to freeze. When the skin thaws, the cells are destroyed, killing the tissue. The dead tissue can be significantly deeper than just the skin if the freeze has penetrated deeply.

Nitrogen splashed into the eyes can do the same damage to the surface of the cornea. Relatively mild burns there could lead to serious vision loss or blindness.

During Semen and Embryo Handlers Accreditations, the Assessors are constantly surprised by the lack of attention to safety. In particular, operators often fail to wear appropriate eye protection and hand protection. When moving large volumes, operators should wear long gloves designed for handling extremely cold items.

A less obvious danger is from suffocating as a result of vaporizing liquid nitrogen expelling the oxygen in a confined space. As liquid nitrogen boils off, it expands nearly 700 times, displacing the oxygen rich air.

Even firms with tight safety standards have lost staff to nitrogen suffocation. CSIRO had a staff member die a few years ago in Geelong. Of the lessons they learnt, one was to improve the oxygen monitoring alarms.

Again during the Semen and Embryo Handlers Accreditations, the Assessors were surprised at the times that the alarms activated, indicating oxygen levels were below 19%.

NHIA supplies Oxygen Monitoring Gas Badges that have LCD readouts of the oxygen content of the air and audible alarms when the oxygen levels fall below safe levels.

Herd Improvement Insights.*Australia takes the Lead in Dairy Genetics***AUSTRALIA TAKES WORLD DAIRY GENETICS LEAD FOR FARMING FUTURE**

The Dairy Cooperative Research Centre (CRC) has identified genetic markers that predict the quality and performance of a bull's offspring – well before its daughters are born – and with as much as 80% accuracy. This is called Genome Wide Selection. It will also allow the genetic potential of individual cows to be assessed.

“Implementation of genomic selection through this advance will create a paradigm shift in the dairy breeding industry, increasing the speed and accuracy of establishing bull performance and improving herd productivity,” said Dr Paul Donnelly, CEO of the Dairy CRC.

This technology will double the precision of genetic selection in young animals. Patent applications have been lodged to protect the intellectual property behind the discovery.

The advance was achieved by screening a record number of 15,000 known genetic markers against the DNA of 1500 proven Australian dairy sires supplied by CRC partner Genetics Australia Cooperative to create a database of over 22 million records. This new dataset was compared with 37 key traits for each of these 1500 bulls. The information was then analysed with an advanced statistical method to determine the accuracy of the best panel of selected markers to predict heritable performance traits.

Currently, the costly PT programs used by semen firms take about 6 years to prove a bull. Using genomic selec-

tion, a bull can be genetically tested for essential traits while still a calf, or potentially even before it is born (as an embryo), predicting the performance of its daughters with great accuracy.

Also, for the first time, the genetic potential of individual dairy cows can be reliably identified. Previously this was not possible due to the small number of offspring and limited number of lifetime lactation records per cow. The new technology can give breeders equivalent information on each cow in their herd as they would get for a young progeny-tested bull. Furthermore, the inherent value of the national cow performance database held by ADHIS could be increased overnight if DNA tested cow records were to be included.

“In the future, farmers will be able to send in a few hairs from their dairy cows or calves, have the genetics analysed, and identify their breeding strategies, including the bull they need to use to optimise genetic gain in their herd,” said Dr Donnelly. “It doesn't replace traditional breeding – but adds a large amount of very useful data and speeds up the process, making Australian dairy producers more internationally competitive.”

Accurate markers which will be available:

Angularity, body depth, bone quality, centre ligament, chest width, cow fertility, foot angle, fore attachment, loin strength, mammary system, muzzle width, overall type, pin set, rear attachment length, rear attachment height, rear leg view, stature, teat length, teat placement, udder depth, udder texture, APR, ASI, calving ease, fat yield, fat percentage, likeability, live weight, milk volume, milking speed, protein yield, protein percentage, cell count, survival and temperament.

About NHIA . . .

Interested in any of the material covered?

Call Chris Braniff, General Manager

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Upcoming Events . . .

- Western District Holstein meeting, 4 December 2006
- International Dairy Week, 14-18 Jan 2007
- NHIA Member Forum, 16 January 2007
- NHIA Dairy Dinner, 16 January 2007

NHIA Board Sets Trading Policy

HG makes break-through with genetic markers

HG (Holland Genetics) selects young test bulls with a revolutionary new technology – genomic selection. From today, thousands of genetic markers are being used to provide extra data in the bull selection process.

Genomic selection is a method that increases the number of genetic markers HG uses for selecting young bulls from just a few to around 3,000. Until now, calves were selected from a young age, based solely on available information about their sire and dam. The new data from thousands of genetic markers will make a huge contribution to the already available information from predicted breeding values on production, conformation, durability and health traits.

Advantages

The wealth of information from genetic markers offers many advantages. It enables HG to ‘judge’ the breeding quality of very young animals with high reliability. This information is being used for deciding which young bull should enter the breeding programme. More specifically this means increased certainty about the qualities of the young bulls and, as a consequence, better breeding sires in the future.

A genetic marker is a small piece of DNA that gives a reliable indication of whether or not an animal possesses a certain genetic trait and the way a specific genetic trait comes to expression. This is particularly important for traits with a low heritability, like many durability and health traits. A lot of daughter information is often needed to gain adequate reliability for the breeding values on these traits. With genomic selection this reliability becomes reality at a much earlier stage.

In practice

In the spring of 2007 the first young bulls selected with the help of genomics will be old enough to be tested.

HG is the first breeding organisation worldwide to apply genomic selection and to take advantage of the investment in this advanced and innovative technology.

Until now, NHIA has not had a firm policy on what goods can be traded with full members and which goods NHIA should not touch. During November, the NHIA Board set a clear policy to guide the various trading deals NHIA manages.

The underlying objective is that trading has to satisfy one or both of two conditions: 1, The trading deal has to provide a direct benefit to the member base by way of allowing easier access to goods or services at rates that are better than the member can negotiate on its own. 2, Trading, where members benefit indirectly due to a small margin which helps fund the activities of the Association.

This second point is of significant importance. Membership fees cover only about 30% of NHIA overheads. Whilst the Board ensures all overheads are kept to a minimum, trading margins allow the Association to continue to operate.

We have always had a clear policy that we will trade with full members only and not with Associate members and this policy has been re-confirmed by the Board.

In addition, the Board has decided that NHIA will not trade in goods or services that are well supplied by current members. That is, NHIA should not compete with the member base.

If a good or service is not well supplied by a member, then NHIA can consider operating in that market, provided that doing so satisfies one or both of the two conditions outlined above. When goods or services become available and offer distinct advantages over existing products sold by members, NHIA will not trade in these goods. However, we have an obligation to help members become aware of these goods.

In the case of the inexpensive imported cryogenic vessels, NHIA will not trade in these. Feedback from members who have used these vessels is largely positive and numerous members expressed strong interest in them.

Contact NHIA for details on how to access these new tanks.

Extension News

From the Extension Study Area

Denise is making good progress in her audit of farmer attitudes and behaviors in the 1000 farm Extension Study Zone, which is broadly bounded by Terang, Timboon, Cobden and Colac.

Her initial audit will populate the NHIA database with details about each of the farms; such as herd size and composition, herd recording and testing activity, breeding activity, supply factory, ownership structure, PT usage, etc.

Initial analysis of the database will reveal a number of projects, each with differing merits to follow-up. For instance, some dairy farms might have use PT and proven semen, but might not herd record. Whilst we could argue the point of selling PT into non recording herds, we won't. What we can agree on is that many of those farmers will be happy to supply non production information and we need to work out what's the easiest way to get it.

Another activity is the production of the Herd Recording Report. This will look at each step in the herd test process, including sample collection, sample identification, weigh station processing, reporting, etc, etc. Each lab uses different methods for each of these steps. Each process will be analyzed for the pros and cons and the report will be used as the basis for the Transfer of Best Practice component of the extension role.

There are a couple of little side projects that have presented themselves. The first is milking speed analysis. With wider use of Electronic Milk Meters, we have the ability to record actual milking speed. This will be compared to the subjective assessment given by farmers. If it correlates well, we could suggest a change in the way the Milking Speed ABVs are calculated from a subjective measure that requires a great number of daughters to an objective measure that could give high reliability with less daughters.

The other small project is the validation of PM only (or AM only) once a day herd test. You will be aware that the Tassie Test is once a day and alternating PM then AM. Work done in the DPI research farm at Ellinbank suggests that a PM only protocol will yield high accuracy data for farmers. This protocol would need to be approved by Records Standards at ADHIS so data to support the protocol will be generated.

For more information, call Denise Burrell on 0430 211 216.

You Are Invited!



Please join us at The NHIA International Dairy Dinner for an Australian style BBQ

The NHIA International Dairy Dinner is an opportunity for guests to relax with friends from around the globe during International Dairy Week.

Dinner commences with Happy Hour where the drinks are complimentary thanks to NHIA. During Happy Hour, BBQ styled finger food will be circulated.

Happy Hour will be followed by prawns, fish and steak from the BBQ, together with salads & sides then followed by dessert.

Details

Venue: Parklake Sundowner Hotel
481 Wyndham Street
Shepparton

Date: Tuesday 16th January 2007
Time: 7:30 pm
Cost: \$49 plus GST

RSVP

Strictly 29th December, 2006
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For more details, please visit
www.internationaldairyweek.com.au

