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Genomics and the Pre-weaned Dairy Calf

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Genomics on many dairy farms starts with testing the pre-weaned calf. Some dairy farmers test the calf at birth, when they are placing ear-tags. Some producers might wait until the calf is over the critical period for illness or mortality, after the first month of life, to avoid testing calves that developed pneumonia (which will hurt her future production performance and survivability) or calves that might be lost to mortality. It can take about 18 business days to get the genomic testing results done so testing at that time period before weaning might work for most farms. Unless the pre-weaning facilities are overcrowded, you can wait until weaning to make decisions on what to do with the calves you tested.

What kinds of decisions will you have to make? It all depends on what you want from your herd. Genomic testing can lead to herd profit potential but there is no cookie-cutter approach. You need to develop a plan based on your herd goals. Are your goals:

- To sell surplus heifers?
- More total milk production?
- More milk components?
- Better reproduction?
- Better health and survivability?
- Efficient grazing?
- Cheese production?

It is vital that you and your team set the goals you want to reach with your herd. The first place to start is to look at where you are now. Your herd records, along with advice from your herd veterinarian and breeding company, and your milk market opportunities can all help you set goals for the herd. If you do not yet have good herd records, you might want to set that as your first goal.

The next step is to pick the available indices on the commercial genomic testing platforms. Are you interested in Net Merit Dollars? Cheese Merit? Fluid Merit? Grazing Merit? Although some producers have

developed their own indices, there are more data behind the standard indices, making them more reliable. Work with the testing company technical services person to help you and once you have decided which traits are most important to your herd, you can test the calves.

What you get back from testing is a spreadsheet of the predicted transmitting abilities and their reliabilities from which you can rank your heifer calves by the index most important to you. You can rank on several indices but recognize it becomes more complicated. Once you have your ranking, you need to have a plan or strategy for what to do with your heifers. Are you going to:

- Sell heifers not meeting farm-established cutoff?
- Breed bottom-end replacements to a beef sire?
- Use top end for sexed semen?
- Use top-end for ovum pick-up (OPU), in vitro fertilization (IVF) or embryo transfer (ET)?
- Use middle-end for embryo recipients?
- Send the bottom end to a feedlot?

Without a concrete plan of what you will do with the heifers, and sticking to that plan, you will not realize the herd improvements you were looking for. With more and more information about genomically tested animals available, economists are getting closer to helping you decide what kind of a herd portfolio is most economical. Until we have those tested economic tools, working with your herd records, using appropriate indices, following your plan, and monitoring your herd's performance is the best way to make herd improvement using genomic testing.

Resources:

A good primer on available indices is: Understanding Genetics and the Sire Summaries from the Holstein Foundation (http://www.holsteinfoundation.org/pdf_doc/workbooks/Gen_Sire_WKBK.pdf)

The Holstein Association USA website has information on genetic evaluations of bulls at: http://www.holsteinusa.com/genetic_evaluations/GenUpdateMain.html

The US Jersey Association has a Genetics Center at: https://www.usjersey.com/AJCA-NAJ-JMS/AJCA/GeneticsCenter.aspx

eXtension has a set of dairy cattle genetics factsheets at: http://articles.extension.org/pages/15694/dairy-cattle-genetics

For videos and factsheets, you can also visit our Genomics of Fertility Website at: http://vetextension.wsu.edu/research-projects/dairygenomics/outreach/