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Working to ensure accurate sample results - Monitoring

As previously presented in the June issue, DHI milk samples have been analyzed for milk fat, protein, and SCC, but there is an even greater wealth of information in each of those milk sample vials. The analysis of DHI milk samples for health screening and reproductive status using ELISA (enzyme-linked immunosorbent assay) testing can provide dairymen and their consultant teams with valuable information on animal disease and/or reproductive status of their herds. Minimizing carry-over and cross contamination while ensuring proper sample handling and identification is a key focus area incorporated into the training of DHI personnel related to milk ELISA testing. Equally important to both the DHI system and dairymen is the assurance of the accurate and reliable test results on a routine basis.

Laboratory proficiency is monitored monthly

One of the mainstays of the QCS DHI-laboratory certification program for milk components is the monthly analysis of 'Samples Unknown,' a blind ring-test of multiple samples with varying levels of each component. Each laboratory is evaluated for accuracy and repeatability with immediate follow-up when deviating outside approved tolerances. With the expansion of the milk ELISA testing, QCS has implemented a voluntary proficiency program to provide both the DHI system and dairymen a monitoring program for laboratory performance.

The ELISA test itself involves multiple steps, each having a source of variation. Yet the real question the dairy manager asks is how can I be sure the wells of the

plate indicating John's positive cows (Picture 1) are accurate and that this result will be translated into a usable report that identifies individual positive and negative cows (for John's in this example.) That is where QCS plays a critical role in the assurance of accurate results from any DHI laboratory. The QCS ELISA Proficiency Program provides each laboratory with a panel of 25 samples on a monthly basis that represent negative, suspect, and positive cows. Laboratories are required to blindly submit results each month for evaluation and comparison across all participants. To ensure that laboratories with multiple technicians performing ELISA assays, technicians rotate in their submissions so that each laboratory technician is evaluated quarterly.

This review by QCS includes both a quantitative and qualitative performance evaluation with results reported back to both the participating laboratories and ELISA test kit suppliers. Picture 2 illustrates a partial certification report that provides useful information on many fronts. This program ensures that not only are the qualitative results accurate and repeatable, but also that the results received by the dairy are interpreted correctly as positive or negative. When areas of non-compliance are identified, the laboratory works directly with test kit manufacturers to identify the source of the variation and implement corrective action in a timely fashion.

In addition to the monthly QCS proficiency program, DHI laboratories participate in the National Veterinary Services Laboratory (NVSL) annual certification program. While the programs are separate, QCS

Accuracy in DHI milk ELISA Monitoring Lab Performance

Johne's ELISA Proficiency Report

Sample	Target	Lab #	Diff	+/-
1	0.011	0.012	0.001	Neg
2	2.546	2.492	-0.054	Pos
3	0.016	0.025	0.009	Neg
4	1.782	1.789	-0.013	Pos
5	1.897	1.712	-0.235	Pos
6	2.922	2.388	-0.234	Pos
7	1.795	1.534	-0.261	Pos
8	2.608	2.382	-0.206	Pos
9	0.032	0.032	0.000	Neg
10	0.020	0.018	-0.002	Neg
11	0.008	0.014	0.006	Neg
12	1.318	1.191	-0.127	Pos
13	1.171	1.009	-0.162	Pos
14	1.197	1.063	-0.134	Pos
15	0.018	0.016	-0.002	Neg
16	0.058	0.063	0.005	Neg
17	1.242	1.220	-0.014	Pos
18	1.881	1.850	-0.031	Pos
19	1.604	1.456	-0.058	Pos
20	1.725	1.693	-0.032	Pos
21	0.032	0.026	-0.006	Neg
22	0.058	0.049	-0.009	Neg
23	1.529	1.380	-0.189	Pos
24	0.009	0.009	0.000	Neg
25	0.057	0.049	-0.008	Neg
		MD	-0.072	
		SDD	0.096	
		Dist	0.120	

Compliance Rates:	
Correct Negatives	100%
Correct Positives	100%
Overall Compliance	100%
Qualitative Interpretation	100%

complements the NVSL annual program by using the same set of unknowns during the annual test month to reduce direct laboratory expenses and provides data submission and programming capture. This cooperative effort adds value to both the quality certification of ELISA labs and the quality of the results ultimately received by the dairy.

New ELISA tests will be evaluated

Current DHI milk ELISA training programs and proficiency programs are



Johne's ELISA Plate Showing Several Positive Reactions

implemented in the marketplace; QCS is poised to provide dairy producers with evaluations of laboratory performance and reliability of these results.

The bottom line...

When compared to the multiple times a cow is tested during a lactation for milk components or SCC, milk ELISA testing is usually a single event. Therefore, the accuracy of the milk ELISA test result is paramount in providing reliable results back to the dairy's consultant team. These data will help dairies make economically sound management decisions that not only offer a solid return on investment in testing, but can add to the dairy's profitability. While DHI field and laboratory technicians do not provide treatment or management protocols to dairies, National DHIA and QCS, along with these professionals, are working to assure that each dairyman's dollar is well-spent on ELISA testing as part of a dairy operation's animal health program.