

I recently had an interesting conversation with a colleague and friend regarding variation in test results from a colostrum feeding study that he conducted. The serum of the mouse will then contain mouse anti-bovine IgG. In this study, my colleague fed calves two different amounts of colostrum (2 L and 4 L) to which was added a compound (0 or 1 gram per feeding) that was expected to improve the apparent efficiency of absorption of IgG in the calves. Other popular methods include turbidimetric immunoassay (TIA) and enzyme linked immunosorbent assay (ELISA). My colleague (we'll call him John) sent his colostrum and blood samples to an outside lab to measure the IgG concentration of the colostrum and serum samples from the calves. So, if we inject the mouse with bovine IgG, after a period of time, the mouse will develop an immune response (i.e., will produce antibodies) to the injected IgG.

Immunoglobulin testing There are a number of methods used to measure the IgG content of various substances. These animals are injected with purified preparations of antibodies from another species – in our case, antibodies from cows. Rats and mice are cheap, easy to maintain and can give you very specific anti-IgG whereas goats and horses can provide lots of serum at a low cost. The exact nature of the compound isn't important here, since it's not available commercially and it didn't work anyway. When John saw the results, he didn't believe them, since the serum results seemed a little lower than expected and the colostrum samples were far more variable (some high, some low) than he expected. Serum samples from the second lab were consistently lower than the first lab and colostrum samples were much more consistent, but were all higher than the first lab! Before we get into the specifics of these two labs and what they did, let's discuss a little bit about testing for immunoglobulins and the nature of the tests that we currently use. We can then collect the serum and use the mouse anti-bovine IgG in our assays. The most commonly used procedure is called radial immunodiffusion (RID). That is, it is possible to raise antibodies to antibodies and use these raised antibodies for diagnostic purposes. Goats, rats, mice and horses are commonly used animals. Well, as you might imagine, John was confounded and upset at the variability in the results. Well, the lab completed their tests and sent the results back. So, John sent a set of samples to a second lab for confirmation. He expected that the results of the testing should all be the same – and they weren't. All of these studies are based on a similar concept. The results that came back only made matters worse. So, what's going on? Let's have a look to see what I mean. In figure 1, we start with a healthy animal – in this case a mouse