Instruments, Hormones, and Furry Puppies: Understanding the Role of Correlation Analysis in Instrument Analysis

In the field of veterinary medicine, accurate diagnostic instruments play a pivotal role in assessing and monitoring various health parameters. Specifically, when it comes to reproductive health in canines, the measurement of progesterone levels holds significant importance. Progesterone, a hormone involved in the reproductive cycle of dogs, influences ovulation, pregnancy, and the maintenance of pregnancy. Therefore, the availability of reliable diagnostic instruments for measuring progesterone levels is crucial for veterinarians and breeders to effectively diagnose and treat reproductive disorders in dogs and to better time breeding cycles.

Correlation Analysis

There are different ways to measure progesterone levels in dogs using different blood tests and instruments. Sometimes, users want to compare measurements from one device to another using correlation analysis. Correlation analysis helps us understand how two things are related to each other. For example, let's say we have data on the height and weight of a group of people. We can use correlation analysis to see how height and weight are connected. For example, a taller person may tend to be heavier. But correlation analysis doesn't tell us if height can replace weight or vice versa. It only tells us about the relationship between the two.

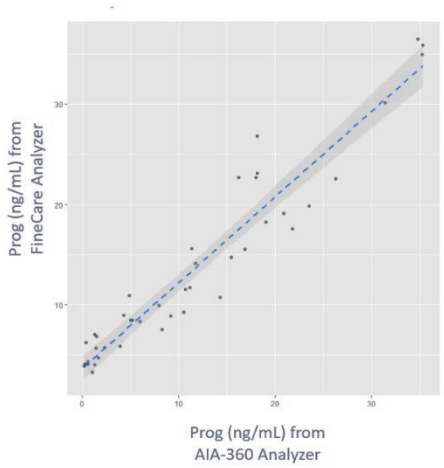
In a different scenario, if we use different instruments to measure the weight of the same person, again correlation analysis can tell us about the relationship between the results. However, to find out how closely the weight measurements from different instruments match or agree with each other, we have to use other statistical analyses like agreement analysis or assess measurement bias and limits of agreement. The weight measurements may not match because there can be differences in how the instruments are made, variations in the way tests are performed, and differences in how the instruments detect and measure weight. Correlation analysis is more about understanding how things are related, rather than if they agree with each other. It's important to use additional analyses beyond correlation to understand the level of agreement between the results obtained from different instruments.

A Comparative Study of cProg Measurements in FineCare PETlife and Tosoh AIA-360 Devices

Below we demonstrate data comparing progesterone concentrations measured by the FineCare PETlife Immunofluorescence Analyzer and Tosoh AIA-360 devices in a sample of 45 dogs of reproductive age. The study sought to determine the correlation between the progesterone concentrations obtained from both devices and investigate the progesterone concentrations in the blood samples. The FineCare PETlife Immunofluorescence Analyzer is a user-friendly and efficient point-of-care testing device. It offers convenience and simplicity, providing rapid results in less than 15 minutes. The analyzer is fully calibrated to minimize errors and ensure accuracy. Its compact size makes it suitable for different settings, and the touchscreen interface allows for easy operation. With streamlined workflows, it requires minimal hands-on time as users simply add the sample to the test cassette and insert it into the analyzer for quick results.

On the other hand, the AIA-360 is an expensive human Dx Analyzer designed for hospital settings. It utilizes robust automated immunoassay technology with Dose Test Cup reagents, eliminating the need for pre-mixing or pre-measuring. However, regular maintenance servicing by an approved engineer is required to ensure precise readings. The AIA-360 analyzer can be calibrated for use with canine samples.

PET life™



To ensure diversity, dogs from various breeds and reproductive statuses were included in the selection. Blood samples were collected from each dog and subsequently split into two aliquots. One aliquot was then analyzed using the FineCare device, while the other aliquot underwent analysis using the AIA-360 device, following the respective manufacturer's instructions. Statistical analysis of the collected data demonstrates a highly significant and strong correlation between the concentration of progesterone measured from the FineCare device and AIA-360 device with a Pearson correlation coefficient of 0.96 and a p-value of 0.001. As one variable increases the other variable tends to increase proportionally.

The graph presented above illustrates the close correspondence between FineCare and AIA-360 in measuring progesterone concentrations. While both devices have shown consistent indications of progesterone concentration, it is important to acknowledge that differences can arise due to variations in instrument design, technology, protocol, calibration, etc.. These factors explain why results from different instruments may not match but can still show a high correlation.

Comparing Progesterone Levels within the Same Instrument

When utilizing an instrument for measuring progesterone levels, it is advisable to compare concentrations within the same instrument rather than across different instruments. This way, a clearer understanding of the changes in progesterone levels can be obtained, while also ensuring adherence to the manufacturer's recommended guidelines for interpretation. This approach ensures consistent and reliable progesterone level assessments because each instrument has its own calibration and operating characteristics. Therefore, relying on the manufacturer's indications within the instrument provides a more accurate and meaningful analysis of progesterone levels. In the table provided are criteria utilized for interpreting progesterone results using Wondfo's FineCare Immunofluorescent Analyzer and Canine Progesterone tests.

There are different ways to measure progesterone levels in dogs, using various instruments and blood tests. However, results from different analyzers may not always match. This happens because each analyzer is designed differently, using different technologies and following different protocols or calibration methods. These differences can cause variations in the results. To ensure consistency and adherence to the manufacturer's recommended guidelines for interpretation, it is advisable to compare concentrations within the same instrument rather than across different instruments when using a specific device.

FineCare Progesterone Indications for Canine Reproduction

Progesterone (ng/mL)	Indication
2-5	Estimated LH Surge Progesterone will begin to rise
6-10	Estimated Ovulation (Varies per female)
10-15	Egg maturation
15-30	Fertile Range
30-40	Estimated time for surgical implant

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