Performance Evaluation of the Vcheck cProgesterone 2.0 in Canine Serum

Key Words : Progesterone, Vcheck, Immulite 2000, Canine ovulation, Reproductive endocrinology

Introduction

Progesterone measurement is a critical tool for determining the optimal breeding time in dogs. Accurate assessment of serum progesterone concentration is essential for predicting ovulation and ensuring successful mating or artificial insemination. Conventional laboratory-based immunoassays provide reliable results but require specialized equipment and longer turnaround time.

To address the need for accurate and rapid in-clinic testing, the Vcheck cProgesterone 2.0 assay was developed as an upgraded version of the Vcheck cProgesterone 1.0 test.

Purpose

The purpose of this study was to evaluate the performance of the Vcheck cProgesterone 2.0 kit by assessing its precision and comparing it with the Immulite 2000 analyzer and the previous Vcheck cProgesterone 1.0 kit.

Materials and Methods

- **Precision Study**
  Level 1 (low), Level 2 (medium), and Level 3 (high) serum samples were analyzed 10 times each with the Vcheck cProgesterone 2.0 kit. Standard deviations (SD) and coefficients of variation (CV%) were calculated to assess precision.
- **Method Comparison**
  A total of 29 canine serum samples were tested using Vcheck cProgesterone 1.0, Vcheck cProgesterone 2.0, and the Immulite 2000 analyzer. Immulite 2000 was considered the reference instrument. Linear regression and coefficient of determination (R^2) were used to evaluate correlation across the total concentration range (< 30 ng/ml) and the low concentration range (< 8 ng/ml).

Results

- **Precision Study**
  The Vcheck cProgesterone 2.0 assay showed strong repeatability with CV% values of 11.5%, 8.0%, and 4.7% for Level 1, Level 2, and Level 3 samples, respectively (Table 1).
- **Method Comparison (Total Range, < 30 ng/ml)**
  Vcheck cProgesterone 1.0 showed good correlation with Immulite 2000 ($y = 1.0645x - 0.1104$, $R^2 = 0.93$), whereas Vcheck cProgesterone 2.0 demonstrated an even stronger correlation ($y = 1.0039x - 0.0027$, $R^2 = 0.99$) (Graph 1).
- **Method Comparison (Low Range, < 8 ng/ml)**
  In the low concentration range (< 8 ng/ml), Vcheck cProgesterone 1.0 showed a correlation of $y = 0.9058x + 0.3645$ ($R^2 = 0.86$), whereas Vcheck cProgesterone 2.0 demonstrated a stronger correlation of $y = 0.9784x + 0.1198$ ($R^2 = 0.95$) (Graph 2). These results indicate that Vcheck cProgesterone 2.0 provides more accurate and reliable results in the clinically critical low concentration range compared to the previous version.

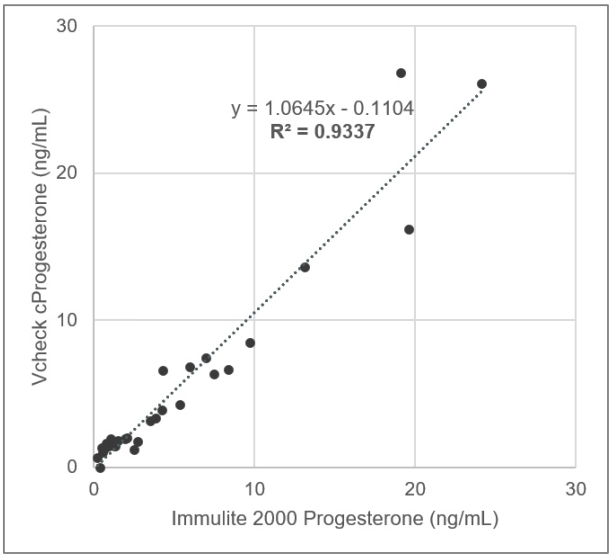
Conclusion

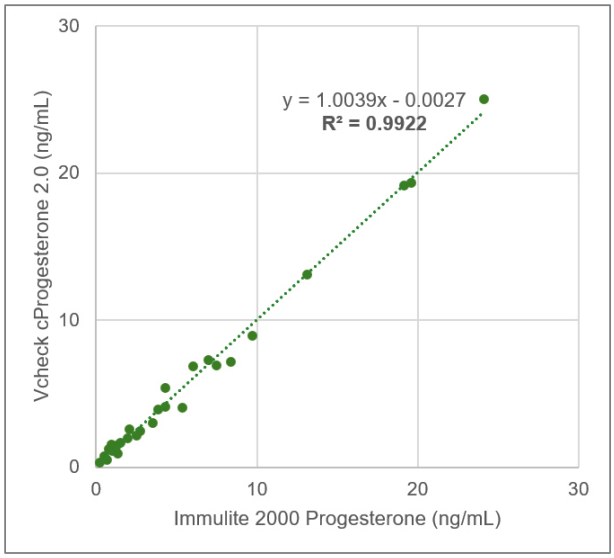
The Vcheck cProgesterone 2.0 test demonstrated high precision and strong agreement with the reference laboratory analyzer. Notably, the improved accuracy in the low concentration range (< 8 ng/ml) makes it particularly valuable for determining the ovulation period in dogs.

These findings confirm that Vcheck cProgesterone 2.0 is a reliable, rapid, and practical in-clinic tool for veterinary professionals, enabling accurate progesterone measurement and improved decision-making in canine reproductive management.

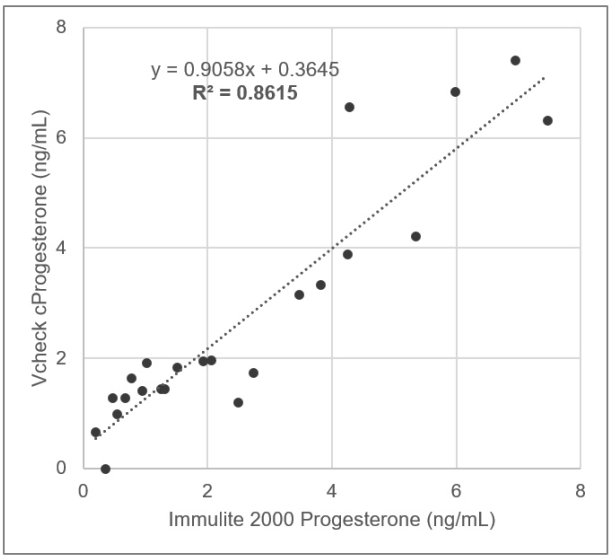
Table 1. Precision study results in canine serum

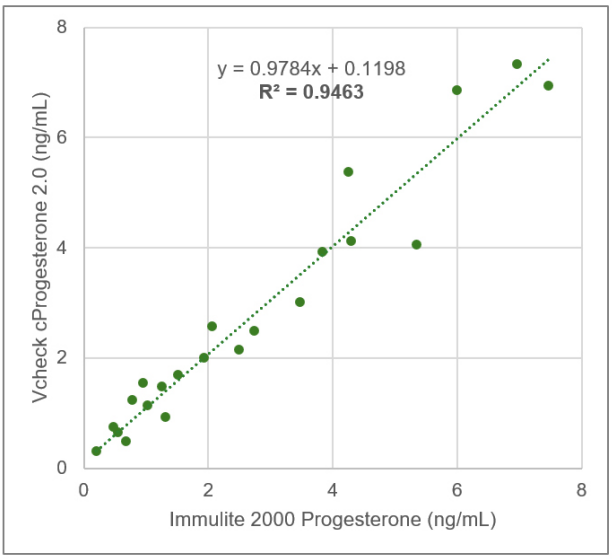
Sample	Level 1	Level 2	Level 3
1	1.35	1.76	7.51
2	1.07	2.03	7.74
3	1.11	1.8	7.96
4	1.09	1.8	7.53
5	0.93	1.77	8.01
6	0.97	1.64	6.85
7	1.07	1.56	7.61
8	0.98	1.54	7.44
9	0.95	1.75	7.29
10	1.12	1.73	7.18
Average	1.06	1.74	7.51
SD	0.12	0.14	0.35
CV (%)	11.5	8.03	4.68





Graph 1. Correlation graphs comparing Vcheck cProgesterone 1.0 (left) and Vcheck cProgesterone 2.0 (right) with the Immulite 2000 in canine serum samples within the total concentration range (< 30 ng/ml).





Graph 2. Correlation graphs comparing Vcheck cProgesterone 1.0 (left) and Vcheck cProgesterone 2.0 (right) with the Immulite 2000 in canine serum samples within the low concentration range (< 8 ng/ml).