Clinical Performance Verification Report of the InSight AI-Cytology Morphological Analyser

Summary

- Blood reproducibility tests indicate good stability of the machine.
- Good correlation was observed between InSight AI-Cytology, Mindray BC-60R and IDEXX for WBC, RBC, PLT and RET linear comparisons.
- InSight AI-Cytology shows clinical consistency with manual microscopy comparison.
- AI recognition of faecal parasites and protozoa is accurate, with efficiency surpassing manual microscopy. Cell detection probability is on par with manual microscopy and AI recognition of conditional pathogens is accurate, with efficiency slightly higher than manual microscopy.
- In urinalysis, InSight AI-Cytology's detection probability is comparable to manual microscopy, with overall good detection consistency. Bacterial detection is more sensitive than manual microscopy.

Blood Test

Repeatability

Blood samples from one dog and cat with high white blood cell counts and low red blood cell counts were selected from for repeatability testing. The results show good repeatability, indicating that the device has good stability.

Repeatability

Sample ID			**Species**	Canine			**Test Date**	27/5/2024			
No.	**WBC**	**NEU**	**LYM**	**EOS**	**MON**	**RBC**	**MCV**	**MCH**	**HGB**	**HCT**	**PLT**
1	34.44	30.56	0.91	0.21	2.76	4.83	65.70	21.58	104.22	31.74	404.56
2	33.53	30.33	0.88	0.40	1.92	4.78	67.62	21.06	100.79	32.36	361.92
3	35.93	32.07	0.89	0.35	2.62	4.96	66.18	21.79	108.00	32.81	413.78
4	30.50	27.46	0.85	0.34	1.84	4.85	66.90	20.59	99.93	32.47	357.31
5	33.87	29.69	1.03	0.51	2.64	4.99	65.40	21.22	105.89	32.64	377.48
6	33.94	29.57	1.47	0.38	2.52	4.81	66.87	19.54	94.07	32.19	414.36
7	34.39	30.05	1.11	0.34	2.89	4.91	65.19	20.33	99.84	32.02	440.29
8	33.67	30.25	0.84	0.45	2.11	4.92	65.76	21.06	103.54	32.33	409.75
9	33.24	29.42	0.83	0.45	2.53	5.02	65.30	21.17	106.24	32.77	427.62
10	35.09	30.65	1.16	0.41	2.87	4.89	66.53	18.35	89.84	32.57	450.67
Intra-Batch CV%	4.0%	3.7%	19.2%	20.6%	14.6%	1.5%	1.2%	4.8%	5.3%	1.0%	7.4%
Acceptance Criteria	≤5%	≤7%	≤30%	≤30%	≤30%	≤3%	≤1.5%	≤5%	≤7%	≤3%	≤10%
Pass/Fail	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Repeatability

Sample ID	QQ		Species	Feline			Test Date	19/5/2024			
No.	**WBC**	**NEU**	**LYM**	**EOS**	**MON**	**RBC**	**MCV**	**MCH**	**HGB**	**HCT**	**PLT**
1	17.9	9.9	5.9	1.5	0.6	5.4	41.6	14.8	80.0	22.4	647.8
2	18.6	10.4	6.0	1.4	0.7	5.6	41.1	15.2	84.3	22.9	581.5
3	18.1	10.8	5.0	1.4	0.9	5.7	42.9	14.1	80.8	24.5	604.5
4	18.8	11.2	5.4	1.5	0.7	5.7	42.4	15.3	86.3	24.0	617.8
5	18.3	10.7	5.3	1.7	0.6	5.6	41.9	14.8	83.2	23.7	631.6
6	18.6	10.8	5.3	1.5	0.9	5.7	42.5	14.5	83.5	24.4	601.7
7	19.9	11.0	6.7	1.5	0.7	5.7	41.9	15.0	85.7	23.9	630.5
8	19.1	11.5	5.5	1.5	0.5	5.7	42.3	15.7	89.3	24.1	627.0
9	17.0	9.0	5.6	1.9	0.5	5.5	43.0	15.8	86.9	23.7	596.5
10	18.7	11.0	5.8	1.1	0.9	5.8	42.3	14.5	84.5	24.7	631.6
Intra-Batch CV%	3.9%	6.4%	7.9%	12.7%	19.8%	2.1%	1.3%	3.3%	3.1%	2.8%	3.1%
Acceptance Criteria	≤5%	≤7%	≤30%	≤30%	≤30%	≤3%	≤1.5%	≤5%	≤7%	≤3%	≤10%
Pass/Fail	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Comparison with the Linearity of Mindray BC-60R

A total of 46 cats and 59 dogs participated in the test. Fresh clinical samples in EDTA blood samples were collected from randomly selected patients. We conducted a correlation analysis on the WBC, RBC, PLT and reticulocyte results of these samples.

Total White Blood Cell Count (WBC): As shown in the following figures, the WBC values are evenly distributed, indicating good correlation of the results.

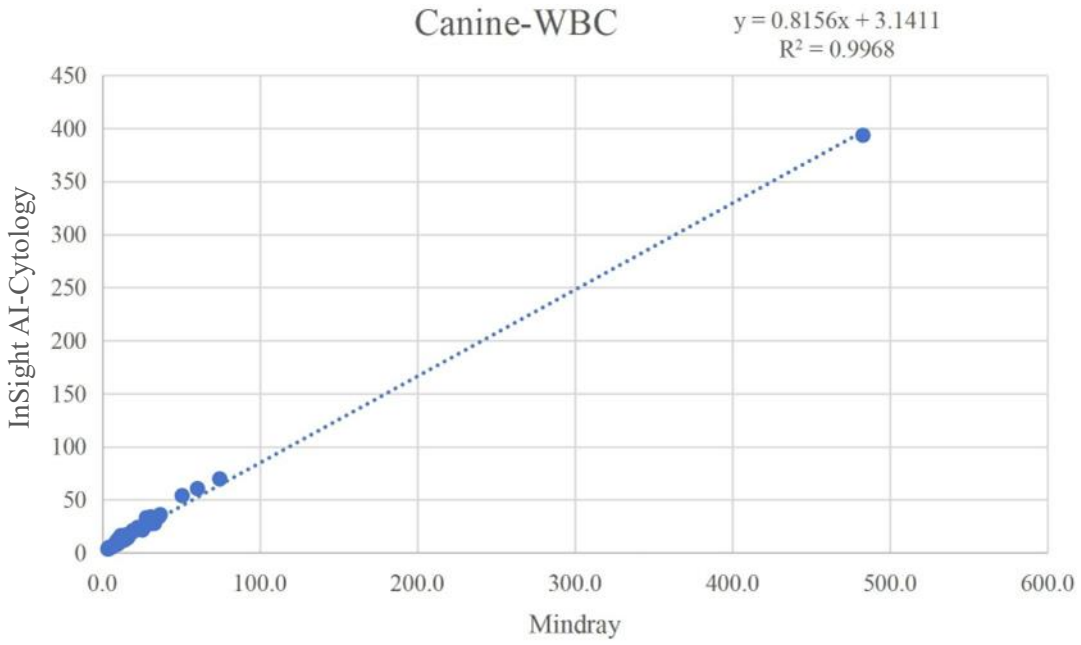


Figure 1: Correlation results of Canine WBC count between Mindray BC-60R and InSight AI-Cytology.

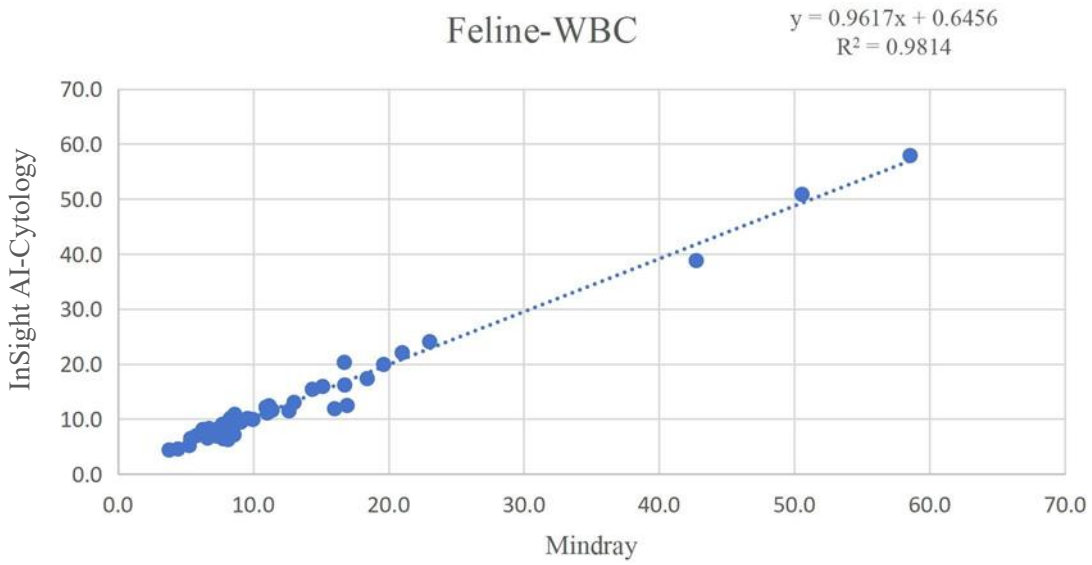


Figure 2: Correlation results of Feline WBC count between Mindray BC-60R and InSight AI-Cytology.

Total Red Blood Cell Count (RBC): As shown in the following figures, the RBC values showed good correlation.

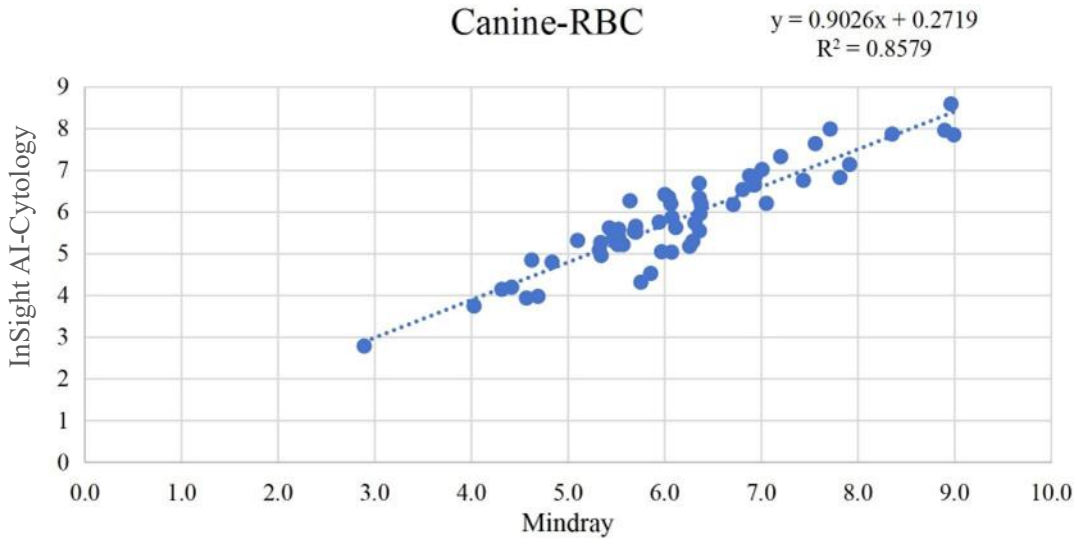


Figure 3: Correlation results of Canine RBC count between Mindray BC-60R and InSight AI-Cytology.

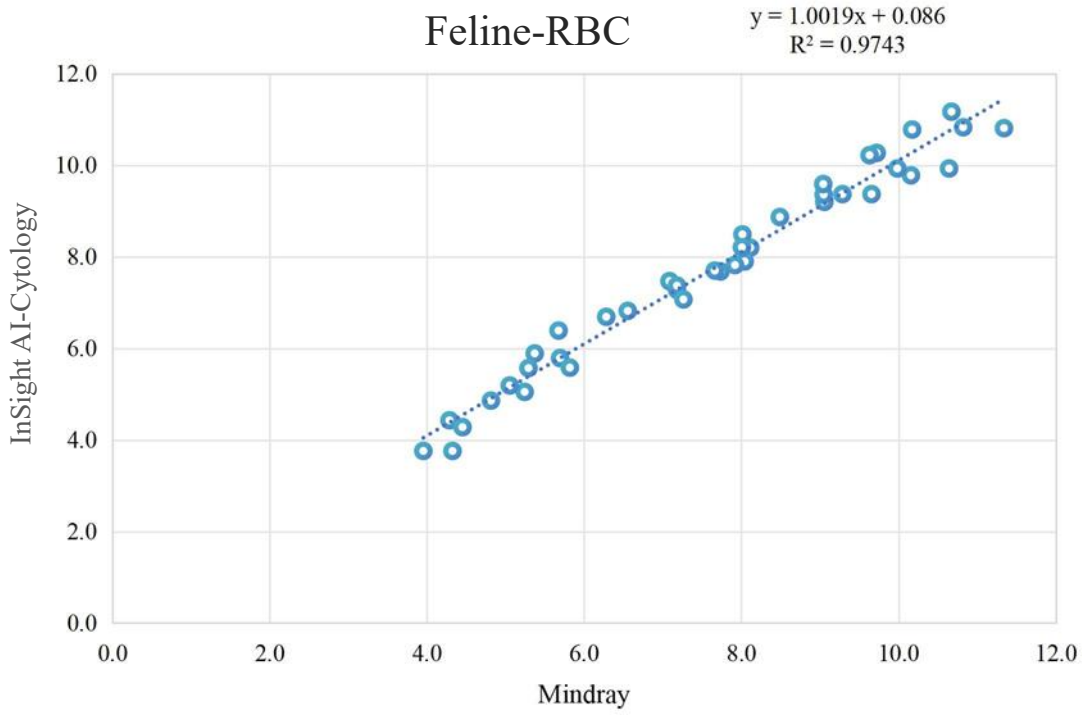


Figure 5: Correlation results of Feline RBC count between Mindray BC-60R and InSight AI-Cytology.

Total Platelet Count (PLT): Due to the tendency of platelets to form aggregation, which can affect the routine blood platelet count, the correlation comparison criteria are adjusted accordingly. As shown in the figure, the platelet values demonstrate good correlation. Additionally, when comparing the positive and negative conformity rates of the two machines, both dogs and cats show a 100% conformity rate.

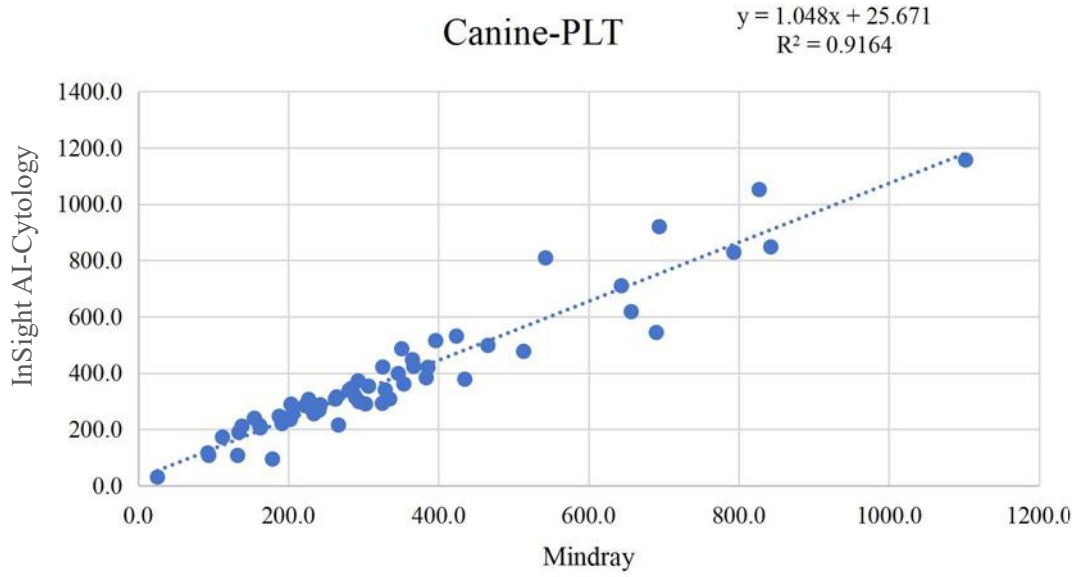


Figure 6: Correlation results of Canine PLT count between Mindray BC-60R and InSight AI-Cytology.

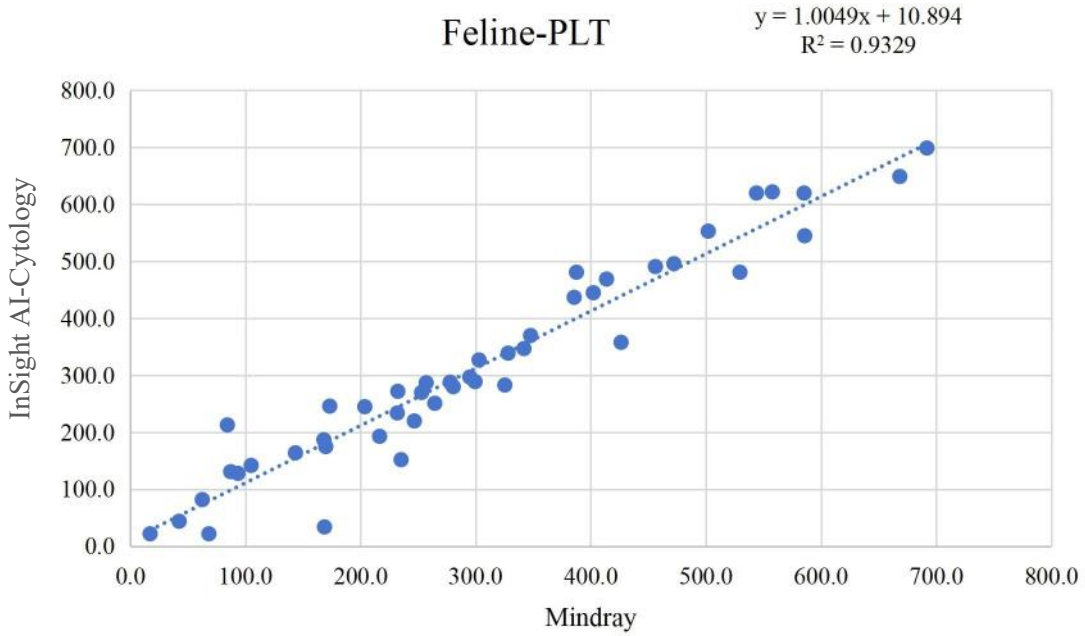


Figure 7: Correlation results of Feline PLT count between Mindray BC-60R and InSight AI-Cytology.

Comparison with IDEXX

A total of 62 cats and 28 dogs participated in the test. The clinical samples used in the test were all fresh EDTA blood samples collected from randomly selected patients visiting the hospital. We conducted a correlation analysis on the WBC, RBC, PLT and reticulocyte results of these samples.

Total White Blood Cell Count (WBC): As shown in the following figures, the WBC correlation is good.

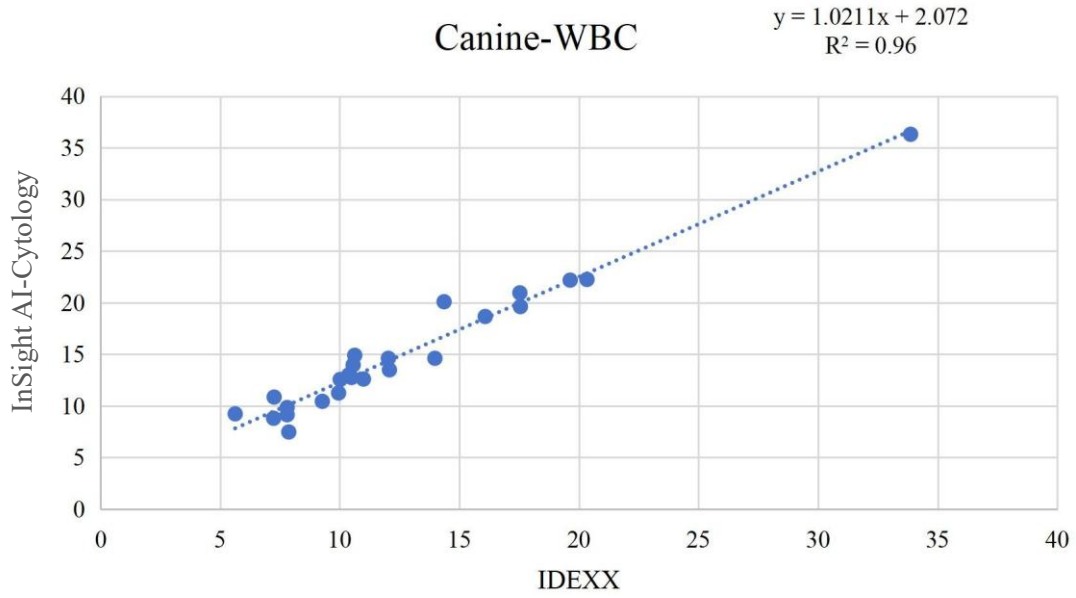


Figure 10: Correlation results of Canine WBC count between IDEXX ProCyte Dx and InSight AI-Cytology.

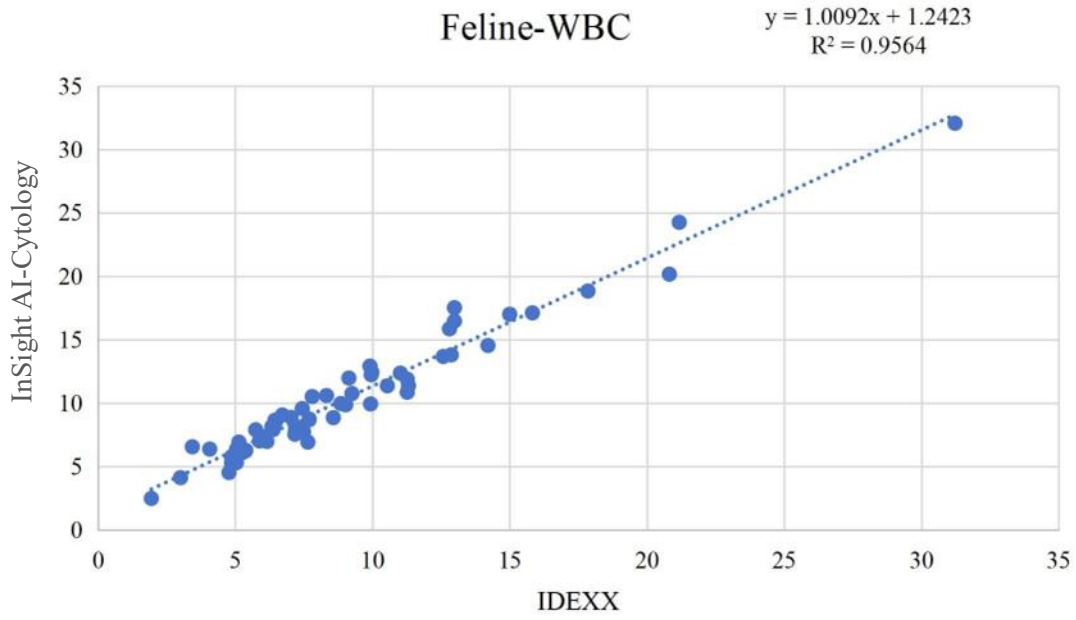


Figure 11: Correlation results of Feline WBC count between IDEXX ProCyte and InSight AI-Cytology.

Total Red Blood Cell Count (RBC): As shown in the following figures, the RBC correlation is good.

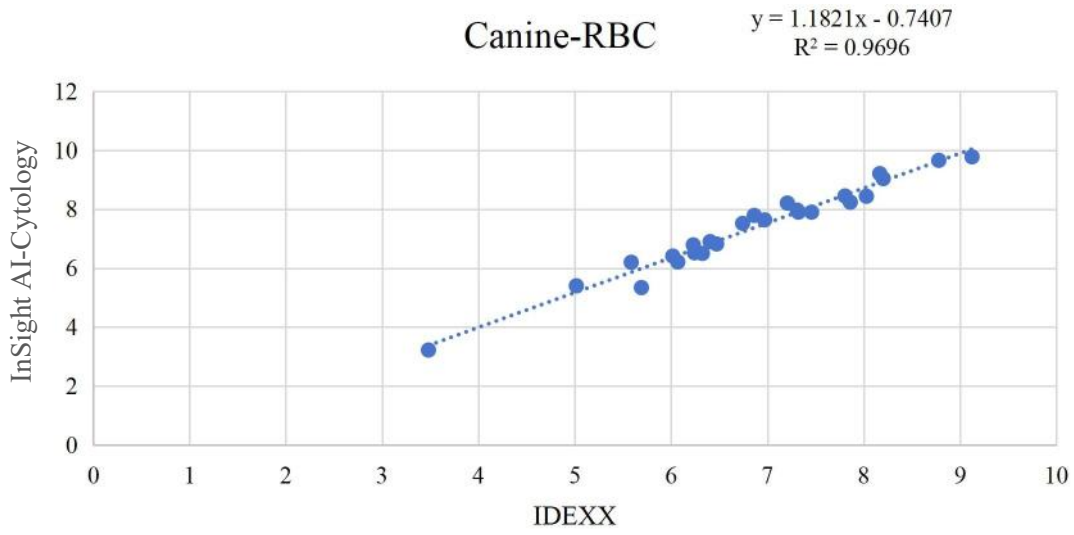


Figure 12: Correlation results of Canine RBC count between IDEXX ProCyte and InSight AI-Cytology.

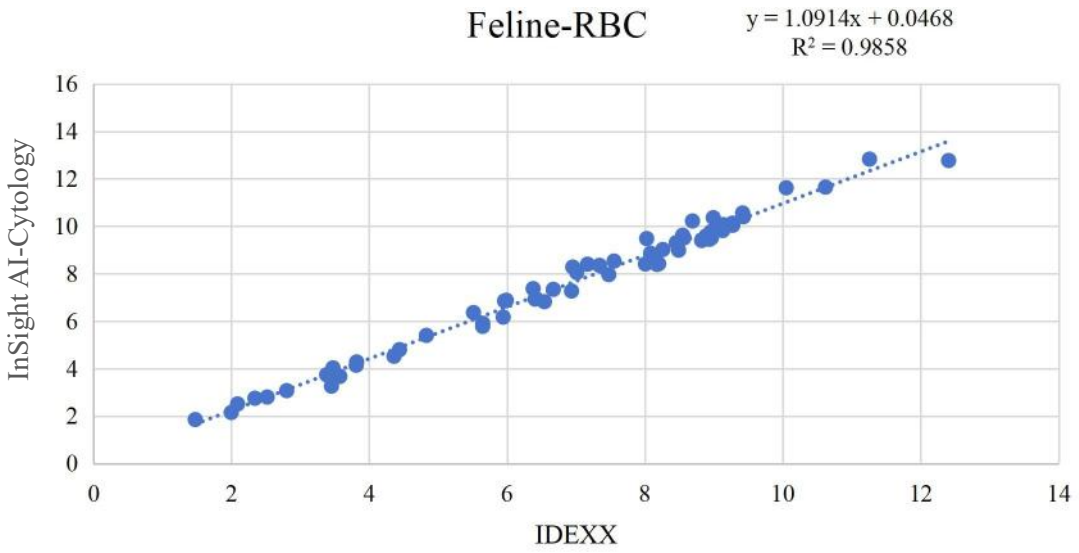


Figure 13: Correlation results of Feline RBC count between IDEXX ProCyte and InSight AI-Cytology.

Total Platelet Count (PLT): Due to the tendency of platelets to aggregate, which can affect routine platelet counting, the correlation comparison criteria are adjusted accordingly. As shown in the figure, the platelet values demonstrate good correlation. Additionally, when comparing the positive and negative conformity rates of the two machines, both dogs and cats show a 100% conformity rate.

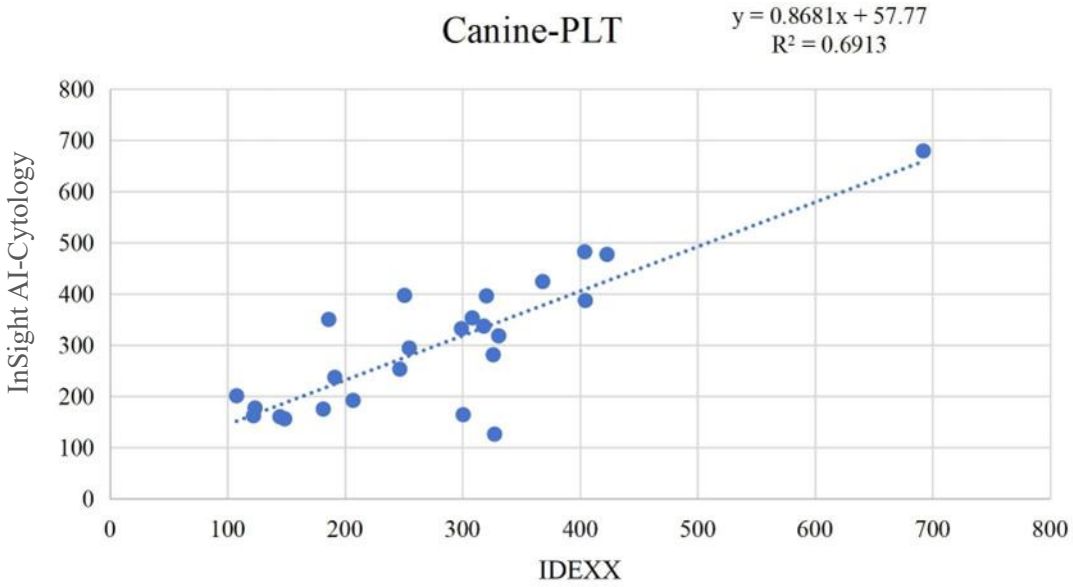


Figure 14: Correlation results of Canine PLT count between IDEXX ProCyte and InSight AI-Cytology.

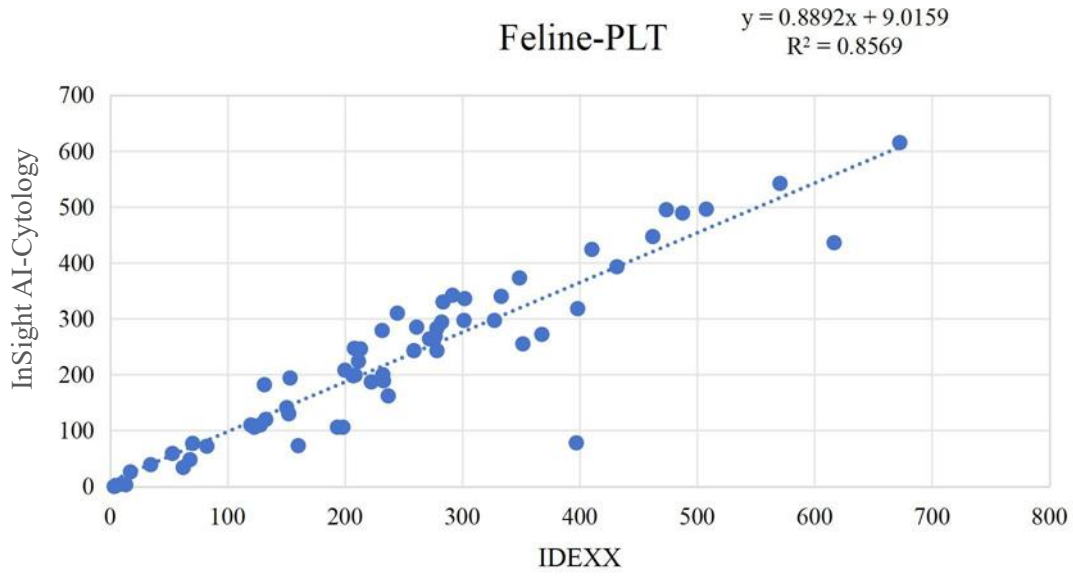


Figure 15: Correlation results of Feline PLT count between IDEXX ProCyte and InSight AI-Cytology.

Comparison with Manual Microscopic Examination

According to the experimental protocol, over 60 samples are required for microscopy consistency evaluation, with more than 20 samples determined to have band neutrophils and more than 20 samples determined to have segmented neutrophils. The current sample collection ratio meets the testing requirements.

The total number of samples participating in this evaluation is 95, including 54 dogs and 41 cats. There are 25 positive samples for band neutrophils, including 21 dogs and 4 cats, with a clinical consistency positive conformity rate of 100%. There are 20 positive samples for segmented neutrophils, including 8 dogs and 12 cats, with a clinical consistency positive conformity rate of 100%.

Canine Band Neutrophils		**Manual Microscopy**			**Positive Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	21	0	21	100%
	Negative	0	33	33	
	Total	21	33	54	

Canine Segmented Neutrophils		**Manual Microscopy**			**Positive Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	8	0	8	100%
	Negative	0	46	46	
	Total	8	46	54	

Feline Segmented Neutrophils		**Manual Microscopy**			**Positive Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	12	0	12	100%
	Negative	0	29	29	
	Total	12	29	41	

Feline Band Neutrophils		**Manual Microscopy**			**Positive Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	4	0	4	100%
	Negative	0	37	37	
	Total	4	37	41	

Conclusion: The clinical consistency evaluation of band and segmented neutrophils is satisfactory.

Linear Range

Conclusion: The correlation coefficients (R^2) for WBC, RBC and PLT are all ≥ 0.98, meeting the requirements.

- WBC Linear Range: 1.95 – 218.2
- RBC Linear Range: 0.28 – 32.68
- PLT Linear Range: 11.22 – 1458.66

Linear Range of WBC				
Dilution Factor	**Test 1**	**Test 2**	**WBC**	**Theoretical Concentration**
1%	2.13	1.77	1.95	2.18
2%	3.55	3.22	3.38	4.36
5%	7.98	8.54	8.26	10.91
20%	39.11	36.86	37.99	43.64
40%	78.84	84.81	81.83	87.28
60%	129.48	129.89	129.69	130.92
100%	203.62	232.77	218.20	218.20

Linear Range of RBC				
Dilution Factor	**Test 1**	**Test 2**	**RBC**	**Theoretical Concentration**
1%	0.28	0.28	0.28	0.33
2%	0.56	0.59	0.58	0.65
5%	1.47	1.50	1.48	1.63
20%	5.83	5.81	5.82	6.54
40%	12.85	12.10	12.48	13.07
60%	19.77	19.71	19.74	19.61
100%	30.26	35.10	32.68	32.68

Linear Range of PLT				
Dilution Factor	**Test 1**	**Test 2**	**PLT**	**Theoretical Concentration**
1%	11.11	11.34	11.22	14.59
2%	23.70	26.95	25.33	29.17
5%	63.26	64.86	64.06	72.93
20%	267.89	266.38	267.13	291.73
40%	600.35	611.39	605.87	583.46
60%	857.22	825.44	841.33	875.20
100%	1369.98	1547.35	1458.66	1458.66

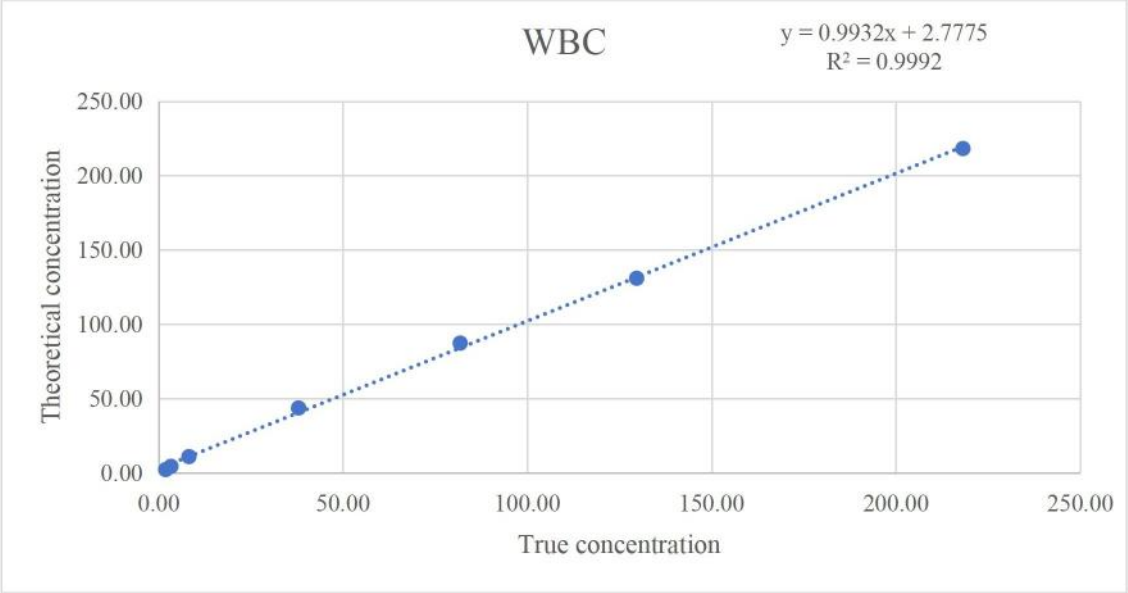


Figure 18: Linear range results of WBC count for InSight AI-Cytology.

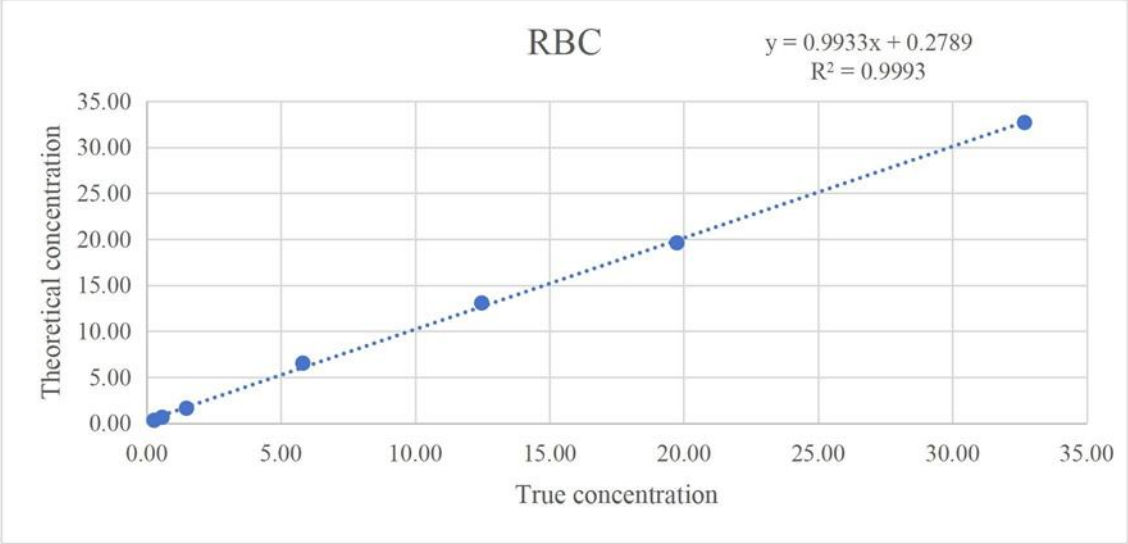


Figure 19: Linear range results of RBC count for InSight AI-Cytology.

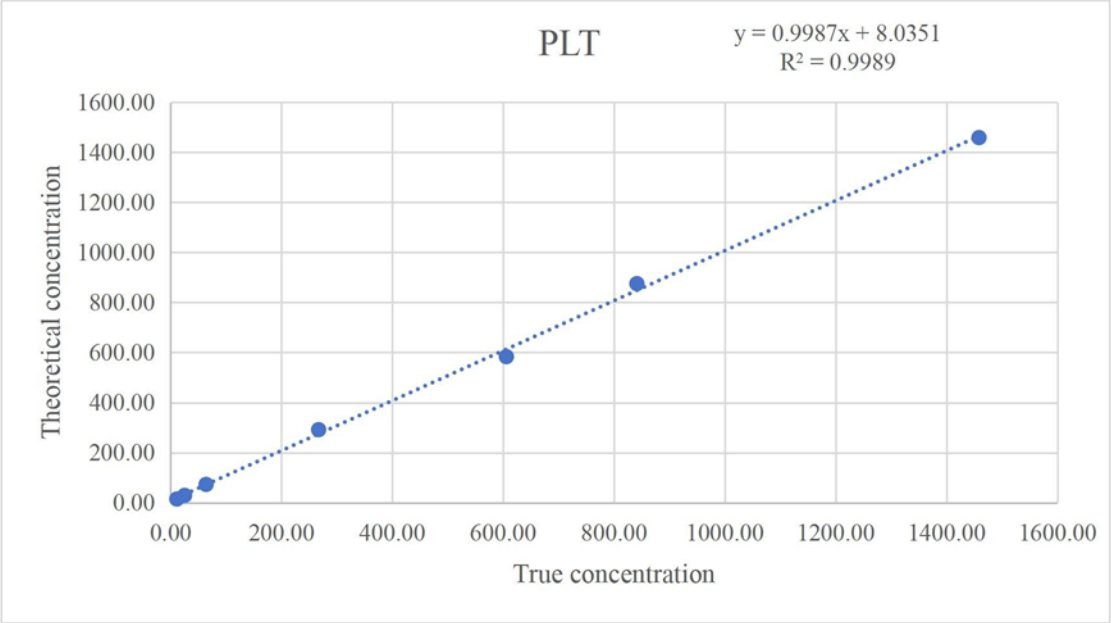


Figure 20: Linear range results of PLT count for InSight AI-Cytology.

Faeces Test

A total of 22 faecal samples were involved in the test evaluation, all of which were routine patient samples requiring faecal examination at the testing hospital. Among these, there were 12 cat samples and 10 dog samples.

Parasite Eggs and Protozoa

Parasite Egg		**Manual Microscopy**			**Positive and Negative Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	0	0	0	100%
	Negative	0	22	22	
	Total	0	22	22	

Protozoa		**Manual Microscopy**			**Positive and Negative Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	1	1	2	95%
	Negative	0	20	20	
	Total	1	21	22	

Figure 21: Detection results of Isosporium Coccidia 1 by InSight AI-Cytology.

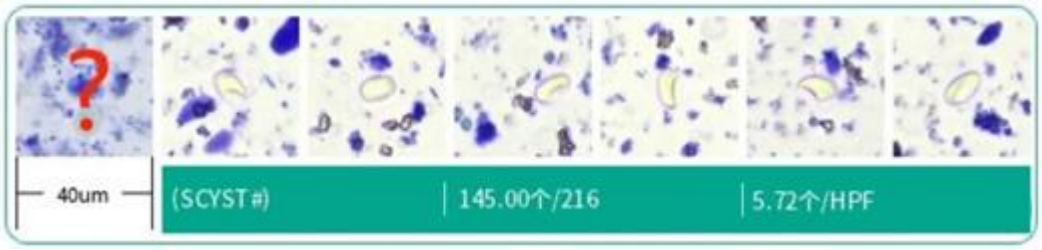


Figure 22: Detection results of suspected Giardia Cyst by InSight AI-Cytology.

During the testing period, no clinically positive samples for parasite eggs were encountered. Therefore, a prepared sample containing coccidian was used to confirm that the machine can correctly identify the eggs.

For protozoa, there was one instance where the machine detected Giardia Cysts in a sample that was negative under manual microscopy, confirming the machine's accuracy in identification.

Conclusion: The machine accurately identifies parasites and protozoa, with efficiency surpassing that of manual microscopy.

Cells

WBC		**Manual Microscopy**			**Positive and Negative Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	5	0	5	59%
	Negative	9	8	17	
	Total	14	8	22	

RBC		**Manual Microscopy**			**Positive and Negative Conformity Rate**
		Positive	Negative	Total	
InSight AI-Cytology	Positive	4	2	6	59%
	Negative	8	8	16	
	Total	12	10	22	

Red Blood Cells and White Blood Cells

Although there were several instances of discrepancies in positive and negative results between red and white blood cells, these discrepancies mostly involved samples with low cell counts. In cases where cell numbers were sparse, there exists a certain probability of detection.

Intestinal Microorganisms

Pathogenic Bacteria		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	14	5	19	73%
	Negative	1	2	3	
	Total	15	7	22	

InSight AI-Cytology's positive samples confirmed as negative under manual microscopy indicate the machine's correct recognition. The efficiency of pathogenic bacteria detection slightly exceeds that of manual microscopy.

Urinalysis

A total of 37 urine samples were involved in the test evaluation, all of which were routine patient samples requiring urine examination at the testing hospital. Among these, there were 23 cat samples and 14 dog samples.

Crystals and Casts

Crystals		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	9	2	11	86%
	Negative	3	23	26	
	Total	12	25	37	

Casts		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	13	4	17	81%
	Negative	3	17	20	
	Total	16	21	37	

Crystals and Casts: Samples that were positive under manual microscopy but negative under InSight AI-Cytology were rare occurrences with a low detection rate.

From the distribution of discrepancies in positive and negative results, it can be observed that the machine's detection rate is comparable to that of manual microscopy.

Figure 23: Detection results of suspected crystal by InSight AI-Cytology.

Figure 24: Detection results of suspected cast by InSight AI-Cytology.

InSight AI-Cytology has parameters for suspected crystals and suspected casts morphology, which maximally prevents potential omissions due to AI recognition capabilities.

Cells, Bacteria and Lipid Droplets

RBC		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	14	1	15	78%
	Negative	7	15	22	
	Total	21	16	37	

WBC		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	22	3	25	84%
	Negative	3	9	12	
	Total	25	12	37	

Epithelial Cells		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	16	0	16	62%
	Negative	14	7	21	
	Total	30	7	37	

Sperm		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	2	0	2	100%
	Negative	0	35	35	
	Total	2	35	37	

Bacteria		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	8	10	18	68%
	Negative	2	17	19	
	Total	10	27	37	

Lipid Droplets		Manual Microscopy			Positive and Negative Conformity Rate
		Positive	Negative	Total	
InSight AI-Cytology	Positive	36	1	37	73%
	Negative	0	0	0	
	Total	36	1	37	

Conclusion

Overall detection consistency is good, with bacterial detection being more sensitive compared to manual methods.

RET Verification

RET Verification Scheme

Purpose

1. This study employed the reticulocyte (RET) typing method recommended by the International Committee for Standardisation in Haematology (ICSH) to accurately classify and quantify reticulocytes.
2. A comparative analysis was conducted between results obtained from the InSight AI-Cytology Analyser and manual microscopy using identical samples. The aim was to assess consistency and validate the accuracy and reliability of the InSight AI-Cytology Analyser for RET detection.

Scope

This verification scheme is designed for the detection process of RET and the related data analysis performed by the InSight AI-Cytology Analyser.

Instrument Under Test

The instrument evaluated in this study is the InSight AI-Cytology Analyser.

Materials and Methods

Sample Collection and Pretreatment

Venous blood samples were collected from dogs and cats at multiple veterinary hospitals in China. Samples were collected into vacuum anticoagulant tubes and mixed gently by inverting 5 – 8 times to ensure thorough anticoagulation.

Testing was performed as soon as possible after collection. If immediate testing was not possible, samples were stored under controlled conditions (e.g., at +4°C) and tested within the prescribed time frame.

Materials

- Devices: InSight AI-Cytology Analyser and binocular microscope (Brand: Awalife)
- Staining Solution: New methylene blue staining solution (Brand: BASO, specialised for reticulocytes)
- Consumables: Vacuum anticoagulant tubes (Brand: Xinli)

Blood Analyser Testing

Anticoagulated whole blood samples were analysed according to the operational instructions of the InSight AI-Cytology Analyser. The RET% values were automatically calculated and recorded.

Staining and Microscopy

1. Preparation of Staining Solution: New methylene blue (BASO) was diluted as per the manufacturer's instructions to prepare a working solution, which was then placed in a staining jar for use.
2. Sample Staining: An equal volume (1:1) of blood sample and staining solution was mixed and incubated at +37°C for 10 – 15 minutes. Subsequently, blood smears were prepared and allowed to dry naturally.
3. Microscopic Observation: Dried smears were examined under a binocular microscope using an oil immersion objective. The monolayer area of the smear was analysed and 1,000 red blood cells were counted in random fields of view. Reticulocytes were classified based on ICSH typing criteria.

Statistical Methods

Data Compilation

Data from the InSight AI-Cytology Analyser and manual microscopy were consolidated into a spreadsheet. Variables included sample identification number, testing date, RET% and reticulocyte typing counts.

Linear Regression Analysis

The results from manual microscopy served as the reference standard (X-axis), while those from the InSight AI-Cytology Analyser were plotted as test values (Y-axis). A scatter plot was generated and the regression equation, $Y = aX + b$, and the correlation coefficient r were calculated.

- Slope (a): Ideally close to 1
- Intercept (b): Ideally close to 0
- Correlation Coefficient (r): Values close to 1 indicate high consistency between the two methods

This analysis determined the linear relationship and consistency between the two detection methods.

Experiment Log

Reticulocyte Typing

ICSH divides reticulocytes into four types (I to IV) based on morphological characteristics and their normal location.

Type	Morphological Characteristics
Ⅰ	RBCs are almost filled with mesh.
Ⅱ	Loosely coiled structure located in the centre of the RBC.
Ⅲ	The reticular structure is sparse and arranged in irregular branch-like patterns.
IV	There are few alkaline substances, which are dispersed fine particles and short filaments.

Type Ⅰ,Ⅱ,Ⅲ corresponds to the aggregate form of reticulocytes, while type IV corresponds to punctate reticulocytes.

Sample Information

As of 11/12/2024, a total of 32 blood samples were collected. Based on the number and typing of RET under microscopic examination, the samples were categorised into high, medium and low-value samples. The sample distribution is shown below.

Sample Type	Dog	Cat
High value (any of I, II, III ≥ 10, ALL ≥ 20)	5	1
Median value (Ⅰ+Ⅱ+Ⅲ≥10,10≥ALL≥20)	3	0
Low value (Ⅰ+Ⅱ+Ⅲ＜10, ALL＞0)	14	9
Total	22	10

Test Results

Dog Blood Sample Microscopic Examination Data and InSight AI-Cytology Test Result Records

	Manual Microscopy							InSight AI-Cytology
Sample No.	I	II	III	IV	RET Total	Total RBCs	RET%	RET%
55617D	1	0	0	11	12	1026	1.17%	0.17%
55638D	4	1	7	14	26	1005	2.59%	0.36%
B016C	2	6	19	51	78	1029	7.58%	5.48%
B017C	0	0	0	1	1	1000	0.10%	0.01%
B019C	0	2	2	17	21	1000	2.10%	1.10%
B022C	2	3	14	8	27	1069	2.53%	0.56%
B024C	0	0	1	1	2	1111	0.18%	0.07%
B025C	0	0	0	147	147	1080	13.61%	0.07%
B026C	0	0	1	3	4	1000	0.40%	0.04%
X508	1	0	0	4	5	520	0.96%	0.42%
B015C	7	13	39	47	106	1048	10.11%	1.64%
55454D	3	3	5	6	17	958	1.77%	0.44%
55448D	0	0	0	0	0	1000	0.00%	0.06%
55472D	0	0	0	0	0	1000	0.00%	0.00%
2022611D	2	1	0	0	3	893	0.34%	0.06%
2022615D	0	0	3	1	4	714	0.56%	0.03%
B001C	0	6	9	16	31	869	3.57%	1.96%
B002C	1	24	117	61	203	1333	15.23%	9.49%
B004C	0	0	4	6	10	964	1.04%	0.19%
B006C	0	1	5	8	14	1045	1.34%	0.56%

	Manual Microscopy							InSight AI-Cytology
B008C	27	35	98	225	385	640	60.16%	16.24%
B009C	0	0	0	0	0	1000	0.00%	0.32%

Cat Blood Sample Microscopic Examination Data and InSight AI-Cytology Test Result Records

	Manual Microscopy							InSight AI-Cytology
Sample No.	I	II	III	IV	RET Total	Total RBCs	RET%	RET
B020F	0	0	2	191	193	974	19.82%	0.17%
B021F	0	2	1	153	156	1072	14.55%	0.07%
B023F	0	1	3	39	43	1006	4.27%	0.11%
B018F	0	0	0	44	44	1000	4.40%	0.08%
B011F	0	0	2	9	11	1000	1.10%	0.00%
B012F	0	0	1	145	146	1535	9.51%	0.01%
B013F	0	0	1	0	1	1000	0.10%	0.01%
B014F	0	0	0	3	3	1000	0.30%	0.00%
B003F	41	50	54	138	283	869	32.57%	8.27%
B005F	0	1	2	191	194	1033	18.78%	0.17%

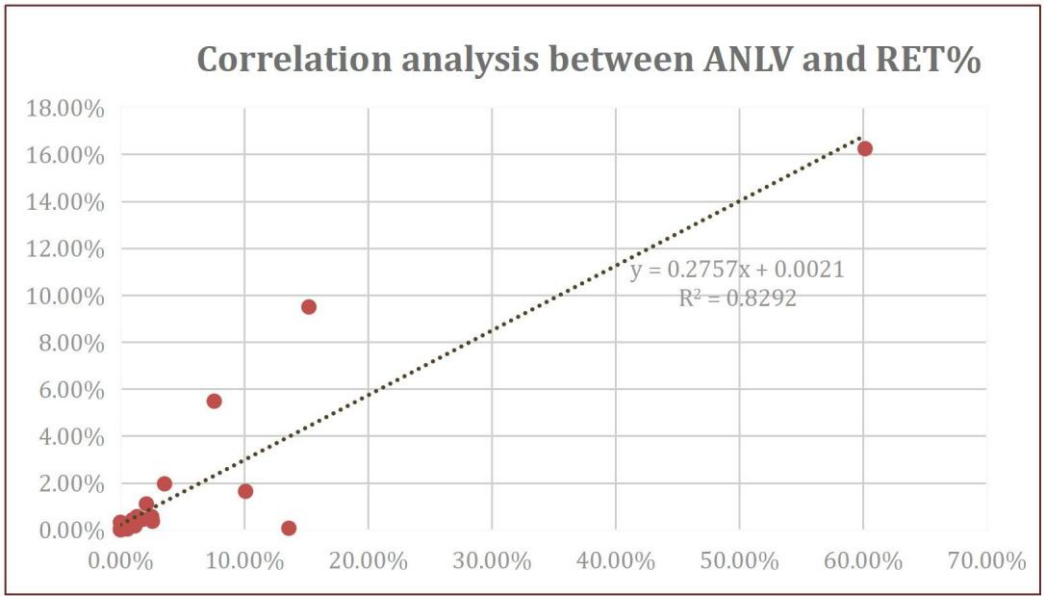
Experimental Results

Correlation Analysis Between Canine Reticulocyte Counts: InSight AI-Cytology Analyser vs. Manual Microscopy

Correlation Analysis of RET% Between the InSight AI-Cytology Analyser & Manual Microscopy
An analysis of the RET% data revealed variations between the results obtained via manual microscopy and those measured using the InSight AI-Cytology Analyser. For manual microscopy, RET% values ranged from 0.00% to 60.16%, while the corresponding InSight AI-Cytology Analyser RET% values ranged from 0.00% to 16.24%.

The scatter plot below illustrates the correlation between the RET% values obtained by the InSight AI-Cytology Analyser and manual microscopy. A fitted linear regression line was derived from the data, with the equation (y = 0.2757x + 0.0021) and a correlation coefficient (R^2 = 0.8292).

This correlation coefficient indicates a strong linear relationship between the two methods, although there is some discrepancy. These fluctuations may result from factors such as sample variability and systematic differences inherent to the detection methods.



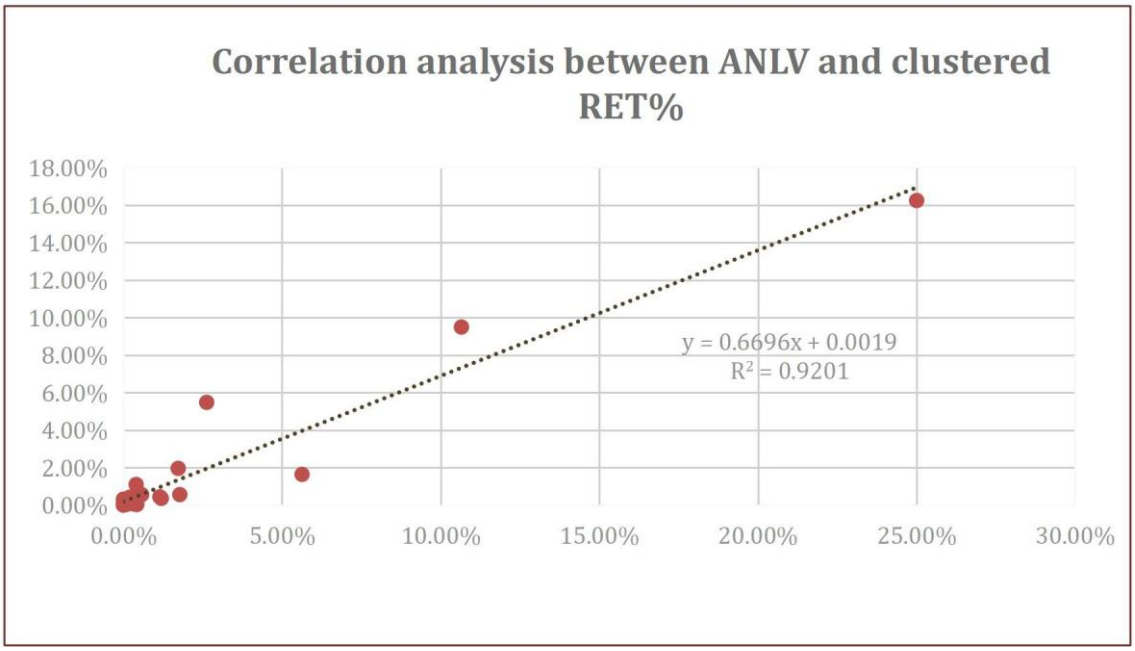
Correlation Analysis Between Aggregated RET% in Manual Microscopy & InSight AI-Cytology Analyser RET%

In practical applications, the observation field of the InSight AI-Cytology Analyser is magnified 400 times, which does not meet the 1000-times magnification required for manual microscopy. This limitation can impact the detection of granular reticulocytes. To address this, granular reticulocyte parameters from manual microscopy were excluded in this analysis, focusing solely on the correlation between aggregated RET% from manual microscopy and InSight AI-Cytology Analyser RET%.

From the data, fluctuations were observed between the aggregated RET% values obtained from manual microscopy and the InSight AI-Cytology Analyser. Aggregated RET% values from manual microscopy ranged from 0.00% to 25.00%, while the corresponding InSight AI-Cytology Analyser RET% values ranged from 0.00% to 16.24%.

The scatter plot below demonstrates the correlation between the InSight AI-Cytology Analyser and manual microscopy RET%. The equation of the fitted regression line is ($y = 0.6696x + 0.0019$), with a correlation coefficient ($R^2 = 0.9201$).

This correlation coefficient is higher compared to the correlation observed when all reticulocyte types (including granular reticulocytes) were included. This improvement suggests that after excluding granular reticulocyte data, the correlation between aggregated RET% and the InSight AI-Cytology Analyser RET% is stronger. These findings further indicate that aggregated reticulocytes provide a more reliable measure in the InSight AI-Cytology Analyser detection, better reflecting the relationship between the two methods.



Correlation Analysis Between Cat Reticulocyte Count Using the InSight AI-Cytology Analyser & Manual Microscopy

Notes

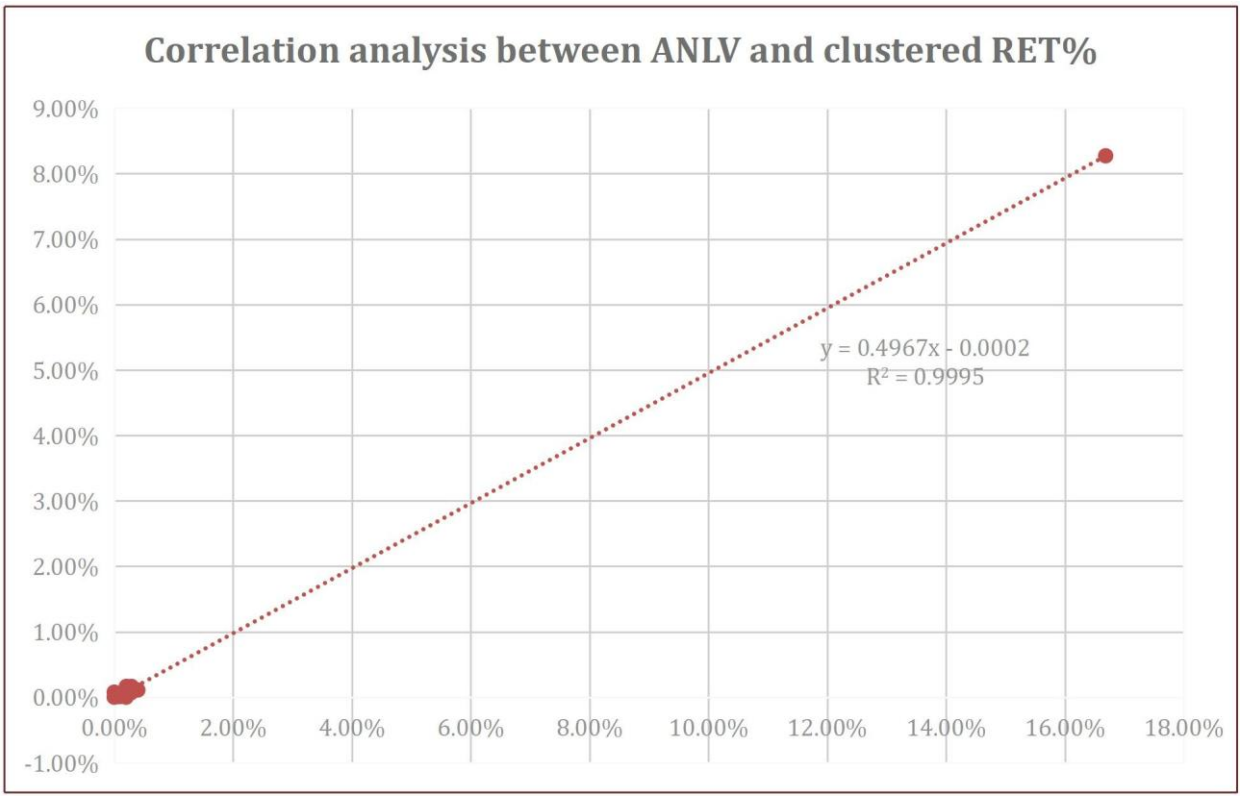
1. RET%: The percentage of reticulocytes is classified based on morphological characteristics into types I, II, III and IV, and collectively recorded as RET%.
2. Aggregated RET%: Reflects the overall activity of bone marrow erythropoiesis, encompassing the RET% values for reticulocytes classified as types I, II and III.
3. Punctate Form RET%: Represents type IV reticulocytes, recorded as RET% specific to type IV according to morphological classification.

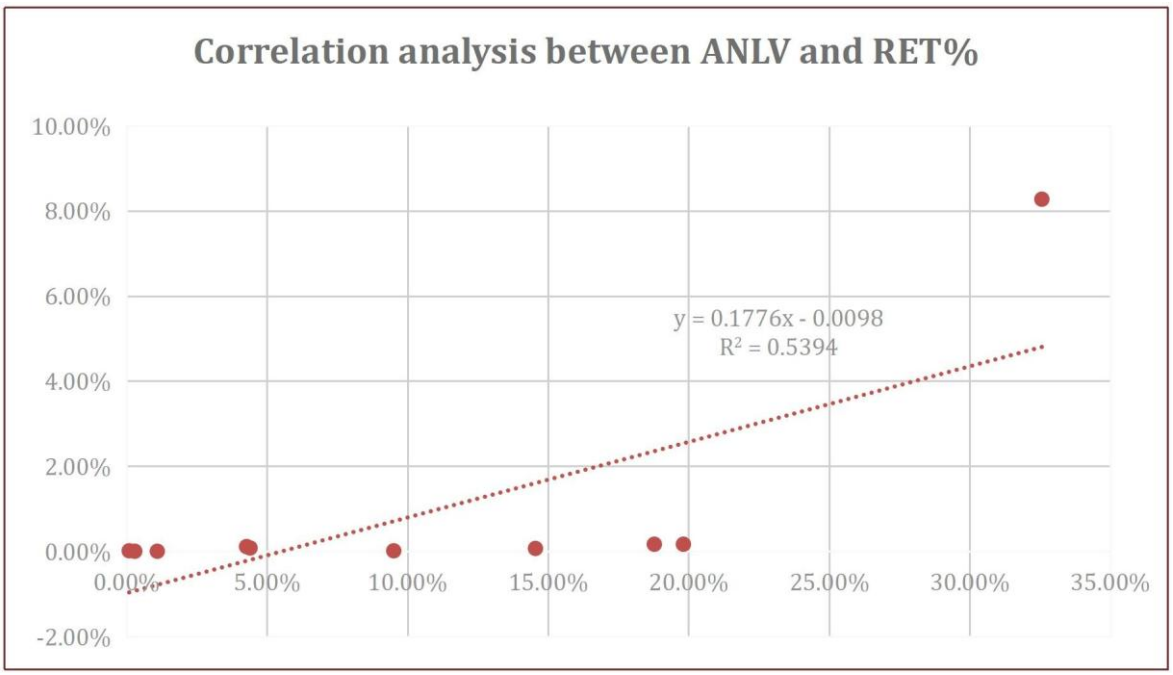
Correlation Analysis Between Cat Reticulocyte Count Using the InSight AI-Cytology Analyser & Manual Microscopy

Correlation Analysis of RET% Between the InSight AI-Cytology Analyser & Manual Microscopy

The comparison of RET% data obtained via manual microscopy and the InSight AI-Cytology Analyser revealed significant variability. RET% values from manual microscopy exhibited a broad range, from 0.10% to 32.57%. Conversely, RET% values recorded by the InSight AI-Cytology Analyser were predominantly lower, with the highest manual RET% of 32.57% corresponding to an InSight AI-Cytology Analyser RET% of 8.27%, and the majority of other values falling between 0.00% and 0.17%.

The scatter plot illustrates the correlation between RET% measurements from the InSight AI-Cytology Analyser and manual microscopy. A linear regression analysis provided a fitted equation: (y = 0.1776x + 0.0098), with a correlation coefficient R^2 of 0.5394. This result indicates a moderate correlation, reflecting differences attributable to methodological variations between the two techniques.





Correlation Analysis Between the InSight AI-Cytology Analyser & Aggregated RET% Detected by Manual Microscopy

From the data in the table, most of the RET% data obtained via manual microscopy were low, with only one high-value sample having a RET% of 16.69%, while the majority were between 0.00% and 0.40%. The corresponding InSight AI-Cytology Analyser RET% data were similarly low, except for an InSight AI-Cytology Analyser RET% of 8.27% corresponding to the manual RET% of 16.69%.

The scatter plot illustrates the correlation analysis between RET% measurements from the InSight AI-Cytology Analyser and manual microscopy. A linear regression analysis provided a fitted equation: (y = 0.4967x + 0.0002), with a correlation coefficient R^2 of 0.9995. However, the correlation observed in this analysis is not of reference value due to the characteristics of the sample distribution. The dataset includes only one sample with a high RET% value, while the remaining nine samples are all low-value samples.

The InSight AI-Cytology Analyser has collected relatively few samples with high reticulocyte counts recently. Efforts will continue to collect additional samples to further verify and supplement the data.

Summary

RET% Test of Canine Blood
This batch of canine blood samples demonstrated good diversity in RET% testing, with a relatively even distribution across median, low and high-value samples, resulting in a high degree of credibility. For samples with extreme anaemia, no fewer than 50 high-power (HP) fields of view were observed during RET counts. This approach was a reasonable adaptation to the situation where counting 1,000 red blood cells was not feasible in these samples. The aggregated RET% of canine blood showed a high correlation with the manual microscopic count, with a correlation coefficient (r) of 0.92. Additionally, a correlation analysis was conducted between the InSight AI-Cytology Analyser and manual microscopic data, yielding a fitting curve of ($y = 0.6696x + 0.0019$). The results indicate that the InSight AI-Cytology Analyser's RET% measurements correlate well with manual microscopy, though the InSight AI-Cytology Analyser's values are consistently lower.

RET% Test of Feline Blood
In this batch of feline blood samples, the RET% values were too low to allow for objective statistical analysis. As a result, no evaluation was performed.