

Evaluation of the Mythic 18 Vet Haematology Analyser

Progress Report – 18.01.2010

OVERVIEW

- Introduction
- Material and Methods
- Results
- Conclusion
- Open Questions

MYTHIC 18-ORPHÉE

- In house haematology instrument (veterinary practitioner)
- 3-part differentiation haematology analyser
- 16 parameter (18)
- Sample volume $\sim 9,8 \mu\text{l}$
- Measurement Principle:
 - WBC/RBC/PLT : Impedance technique
 - Haemoglobin: Spectrophotometry at 555 nm
 - Haematocrit: Volume integration



Pic. 1: Mythic 18

MATERIAL AND METHODS

1. ACCURACY

- Reference methods
 - Sysmex XT 2000 iV: WBC, RBC, PLT, Indices
 - Manual HCT
 - WBC differential by microscopy (blood smear) resp. electrical differentiation of the Sysmex XT 2000 iV
- EDTA-blood: 122 Dogs, 129 Cats, 123 Horses

2. PRECISION

- Within-run
- Day-to-day

3. LINEARITY

4. CARRY-OVER

5. CELL AGING

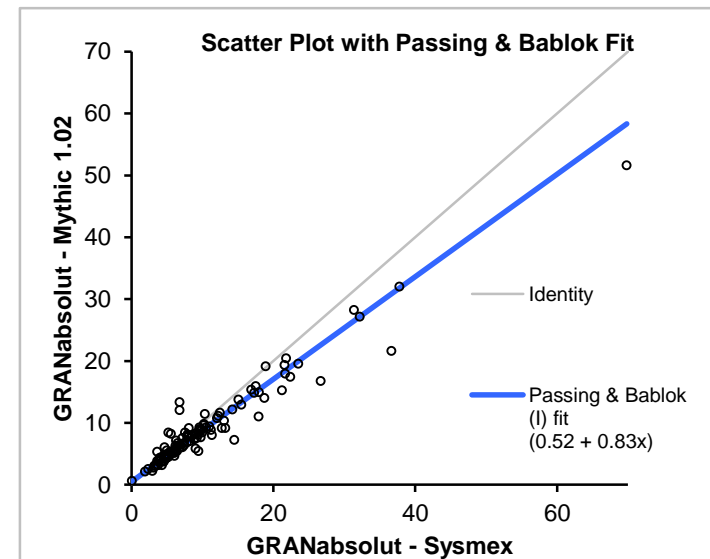
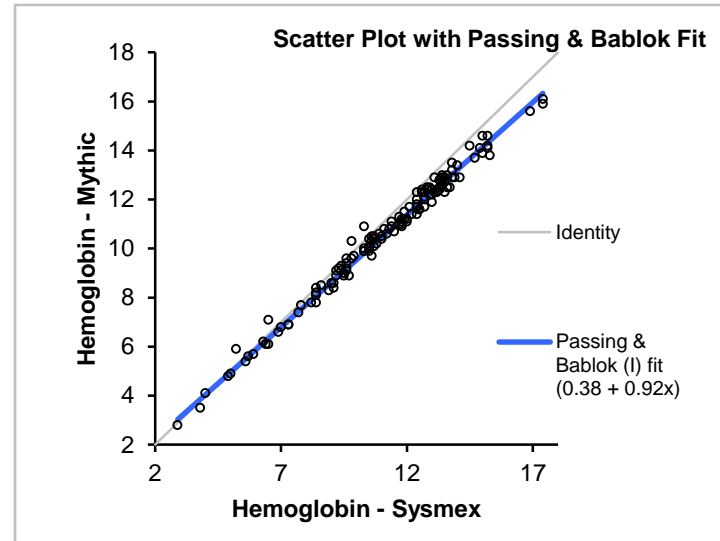
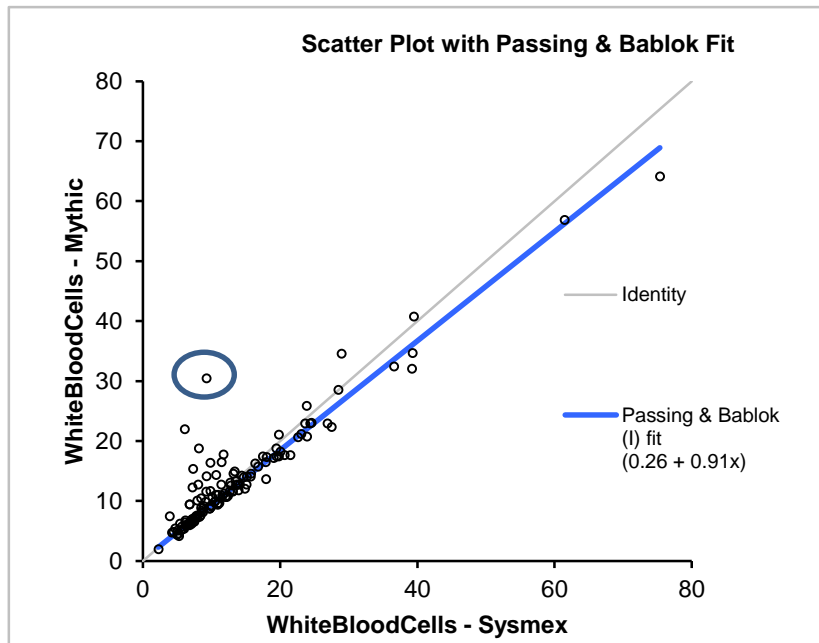
ACCURACY

Parameter	Species	Coefficient of correlation	Intercept (Confidence interval)	Slope (Confidence interval)	Bias (95% Limits of agreement)
WBC	Cat	0.94	0.26 (-0.14 to 0.61)	0.91 (0.88 to 0.95)	-0.074 (-6.959 to 6.815)
	Dog	0.99	0.98 (0.68 to 1.36)	0.95 (0.92 to 0.98)	0.229 (-3.651 to 4.110)
	Horse	0.98	0.38 (0.17 to 0.56)	0.94 (0.92 to 0.97)	-0.126 (-1.496 to 1.243)
RBC	Cat	0.99	0.51 (0.37 to 0.66)	0.95 (0.93 to 0.97)	0.09 (0.400 to 0.581)
	Dog	0.99	0.26 (0.15 to 0.4)	1.0 (0.98 to 1.02)	0.241 (-0.096 to 0.578)
	Horse	0.98	0.38 (0.21 to 0.57)	0.93 (0.91 to 0.96)	-0.14 (-0.693 to 0.414)
HGB	Cat	0.99	0.38 (0.21 to 0.54)	0.92 (0.9 to 0.93)	-0.511 (-1.256 to 0.234)
	Dog	1	1.02 (0.81 to 1.26)	0.93 (0.92 to 0.95)	0.1 (-0.57 to 0.76)
	Horse	0.98	0.48 (0.08 to 0.76)	0.94 (0.92 to 0.98)	-0.25 (-1.09 to 0.58)

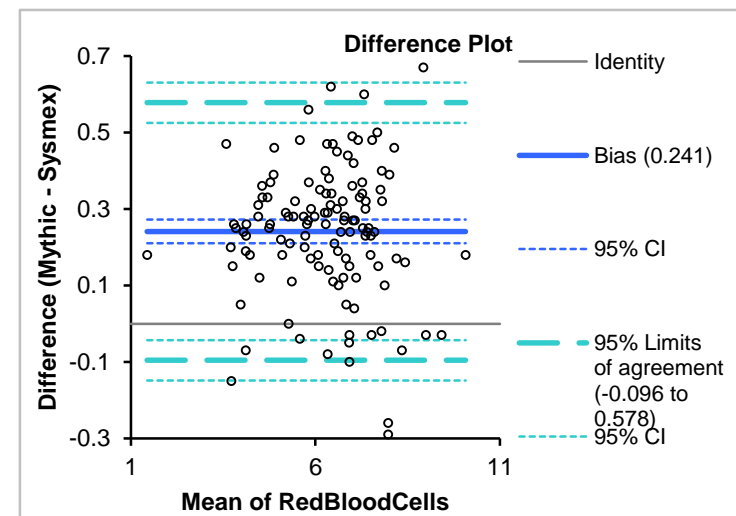
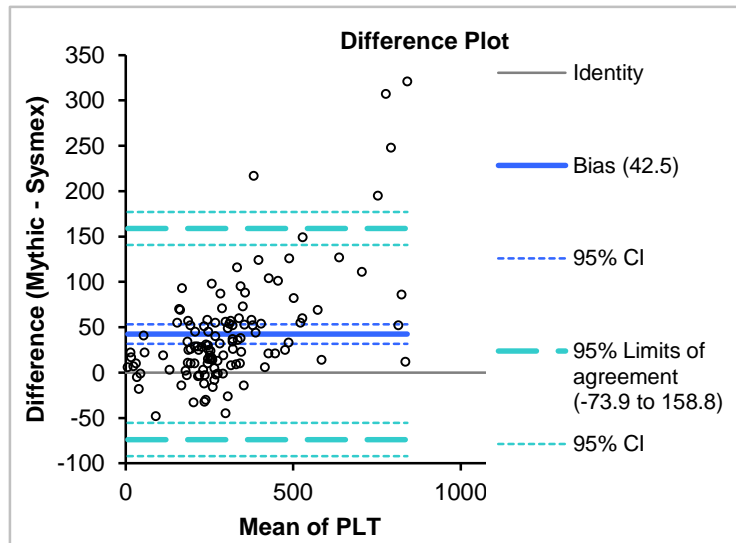
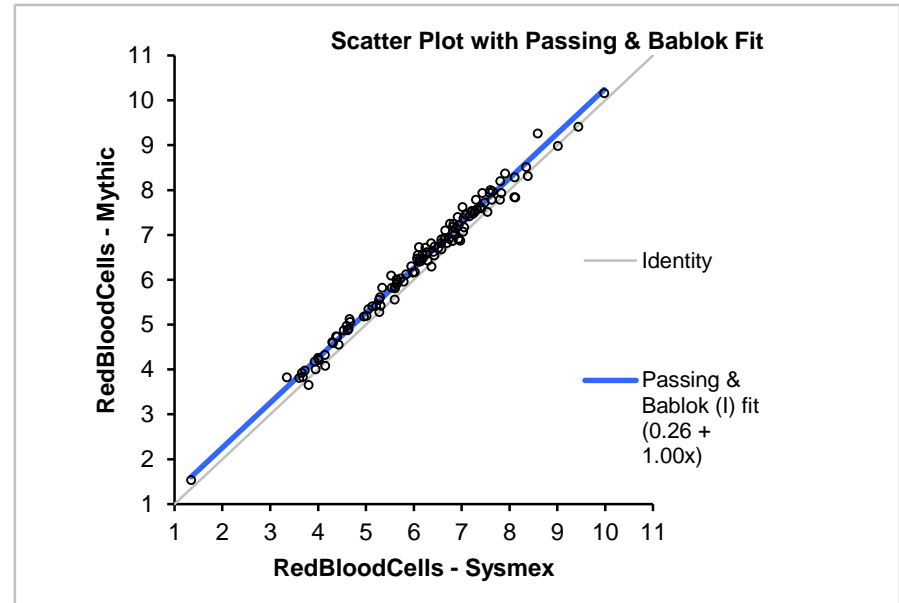
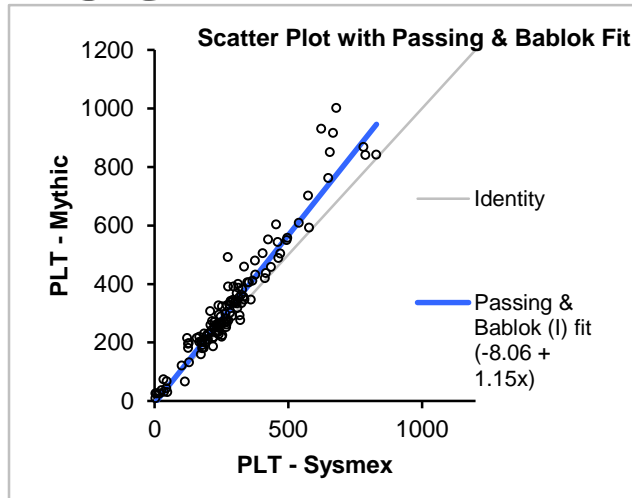
ACCURACY

Parameter	Species	Coefficient of correlation	Intercept (Confidence interval)	Slope (Confidence interval)	Bias (95% Limits of agreement)
HCT	Cat	0.99	2.05 (1.23 to 2.74)	0.94 (0.92 to 0.97)	0.16 (-2.15 to 2.48)
	Dog	0.99	1.2 (0.05 to 2.13)	0.95 (0.93 to 0.98)	-0.79 (-3.42 to 1.83)
	Horse	0.99	1.36 (0.43 to 2.13)	0.96 (0.93 to 0.98)	-0.17 (-1.95 to 1.61)
MCV	Cat	0.95	4.65 (2.5 to 7.12)	0.91 (0.85 to 0.96)	0.86 (-2.62 to 4.33)
	Dog	0.96	8.01 (4.54 to 11.37)	0.83 (0.78 to 0.88)	-3.16 (-6.03 to -0.28)
	Horse	0.94	3.62 (1.08 to 5.82)	0.9 (0.85 to 0.95)	-1.02 (-3.68 to 1.63)
PLT	Cat	0.8	-9.47 (-52.65 to 23.06)	0.88 (0.74 to 1.05)	-38.3 (-225.5 to 149)
	Dog	0.97	-8.06 (-27 to 7.22)	1.15 (1.1 to 1.22)	42.5 (-73.9 to 158.8)
	Horse	0.84	-18.08 (-37.57 to 4.82)	1.04 (0.93 to 1.16)	1.3 (-82.3 to 84.9)

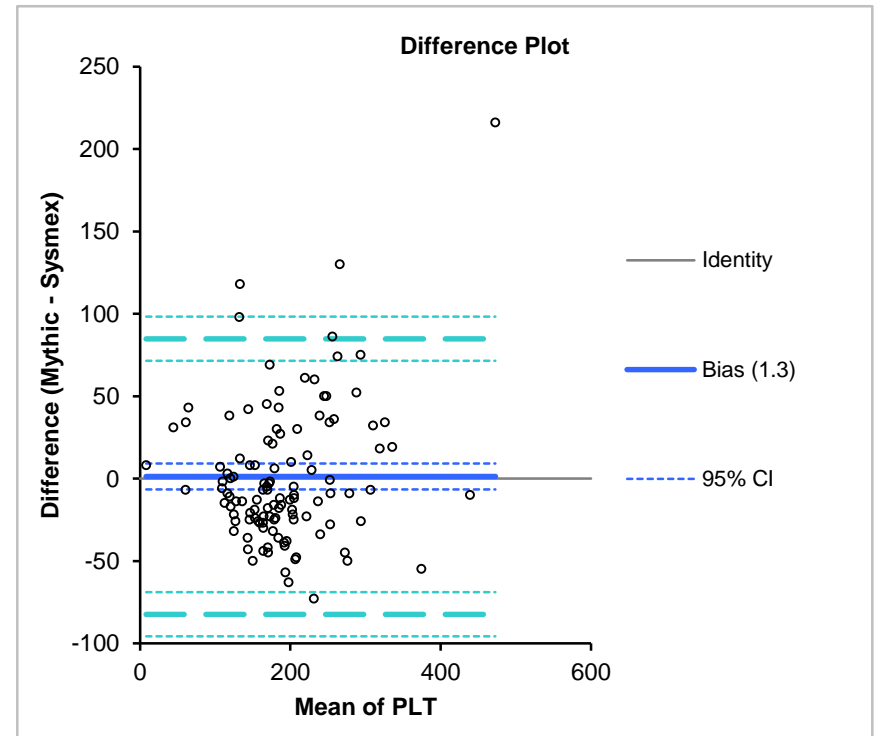
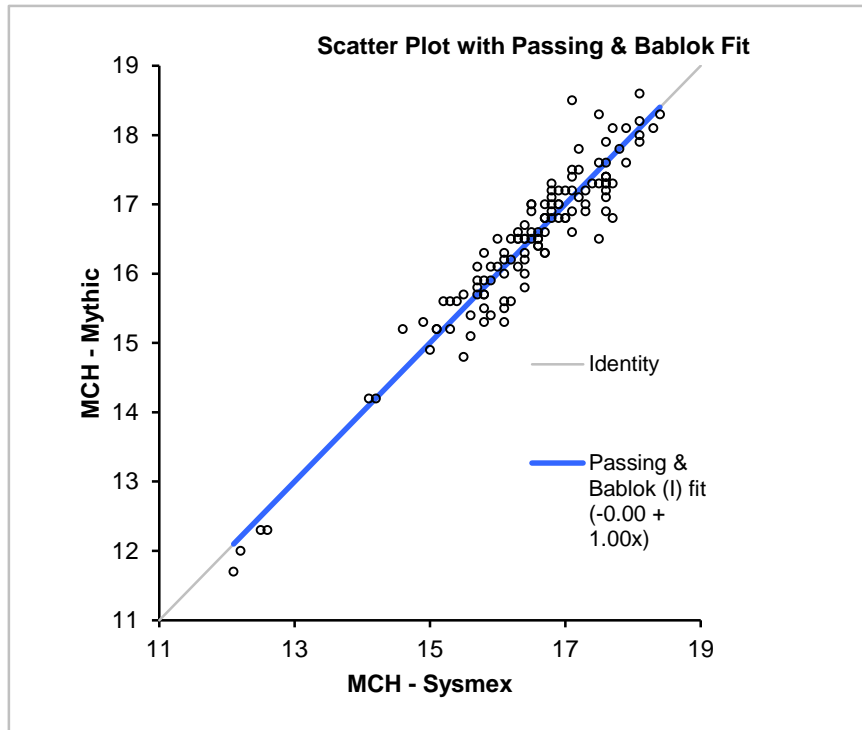
CAT



DOG



HORSE



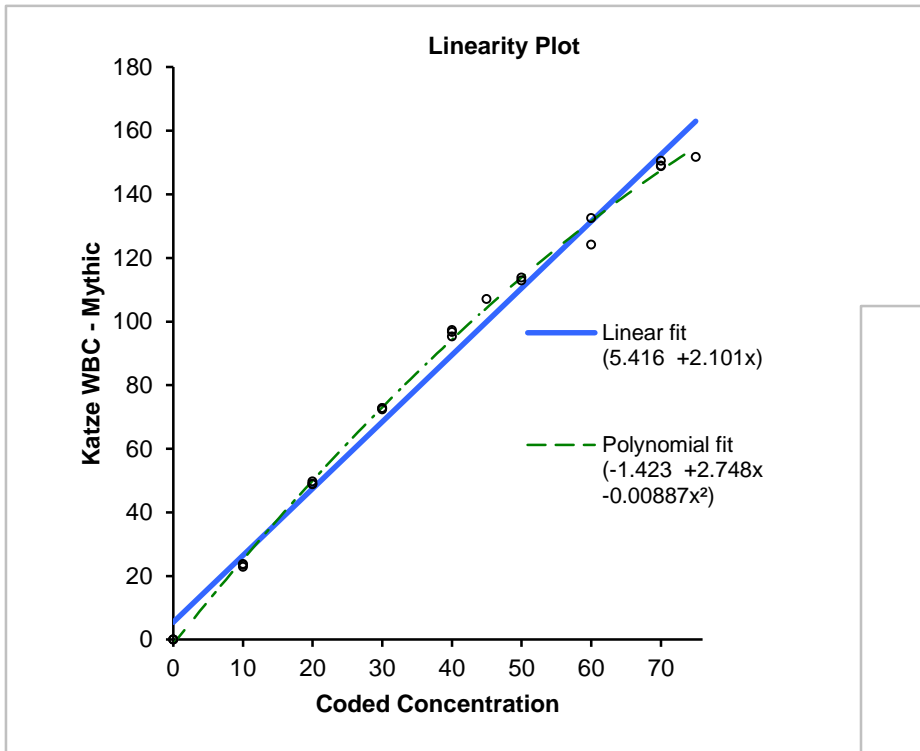
PRECISION: Within-run

Parameter	Species	Low		Middle		High	
		Mean	Coefficient of variation	Mean	Coefficient of variation	Mean	Coefficient of variation
WBC x 10 ³ /μl	Cat	1.96	2.50	6.81	1.50	40.92	1.17
	Dog	2.99	1.92	6.77	1.68	80.71	0.98
	Horse	1.72	2.72	7.85	1.58	19.76	0.95
RBC x 10 ⁶ /μl	Cat	6.96	1.30	9.17	0.72	6.04	0.94
	Dog	3.99	0.75	7.85	0.54	4.87	1.32
	Horse	6.25	1.18	8.85	1.01	11.48	0.78
PLT x 10 ³ /μl	Cat	133.47	5.65	249.73	4.63	170.07	6.91
	Dog	305.73	3.17	215.47	3.98	144.53	6.23
	Horse	105.79	10.24	205.36	4.67	73.21	7.66

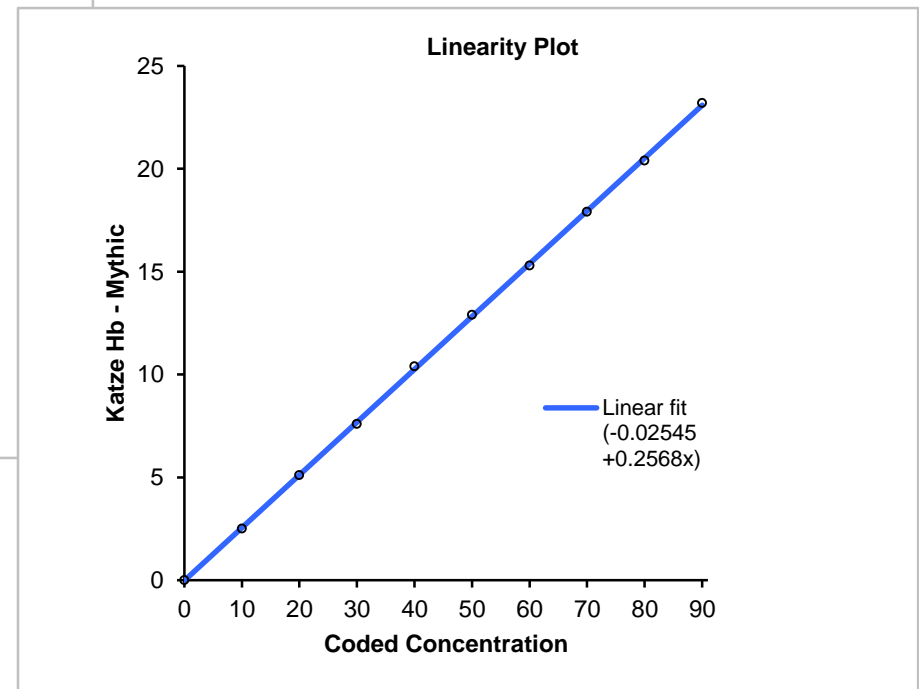
PRECISION: Day-to-day

Parameter	Low		Middle		High	
	Mean	Coefficient of variation	Mean	Coefficient of variation	Mean	Coefficient of variation
WBC x 10 ³ /μl	2	3.2	7.4	2	19	0.8
RBC x 10 ⁶ /μl	2.57	1.9	4.97	1.6	5.99	1.2
HGB g/dl	6.6	2.2	14.4	1.5	18.8	1.4
HCT %	17	2	36.9	1.2	48	1
MCV fl	66.2	0.8	74.2	0.7	80.2	0.6
MCH pg	25.6	1.9	28.9	1.6	31.4	1.3
MCHC g/dl	38.7	1.9	39	1.4	39.1	1.3
PLT x 10 ³ /μl	84	8.4	236	5.9	482	4.6
LYM x 10 ³ /μl	1.1	5.7	2.1	5.1	3.1	6.6
MON x 10 ³ /μl	0.2	20.1	0.4	9.4	0.6	3.6
GRAN x 10 ³ /μl	0.7	7.9	4.8	2	15.4	1.2

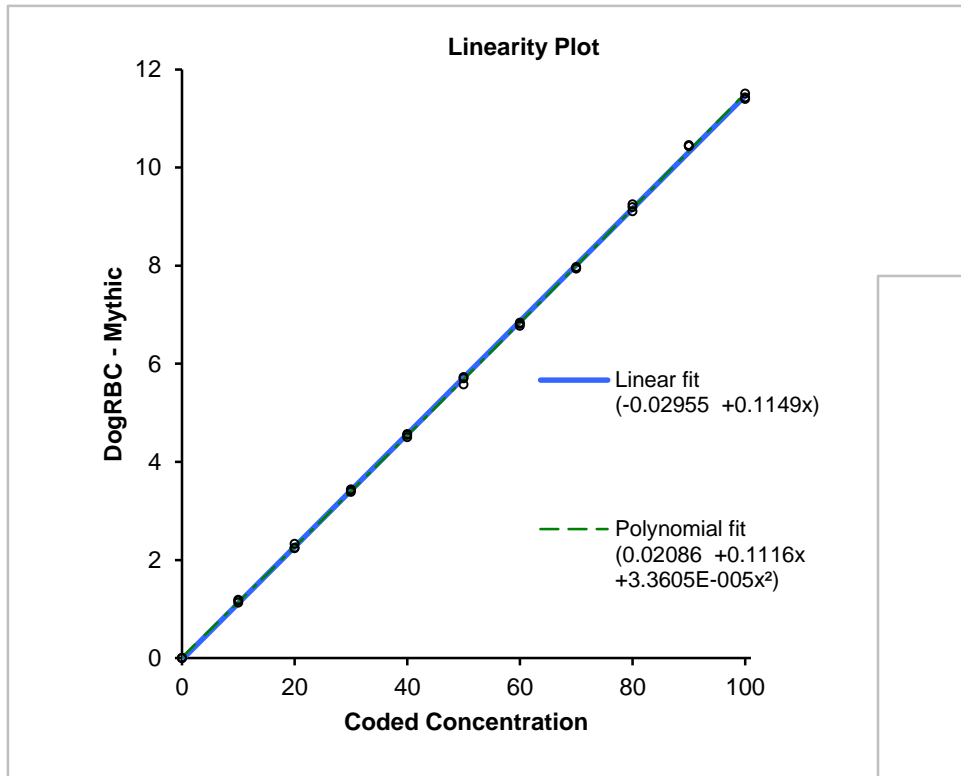
LINEARITY: Cat



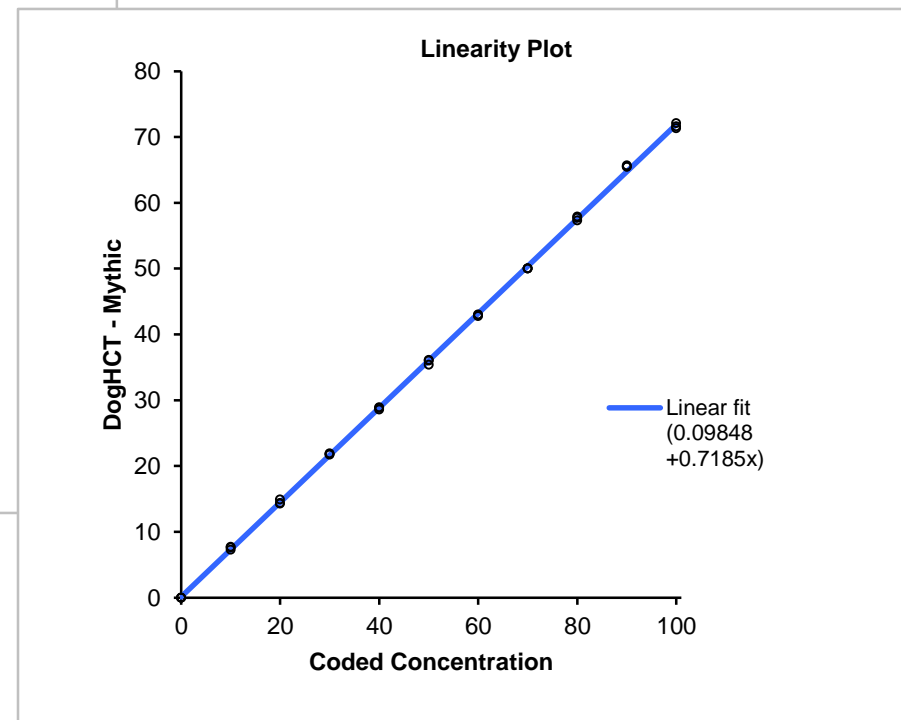
WBC: -100.000
RBC: >14.000.000
HGB: >23
HCT: -70%



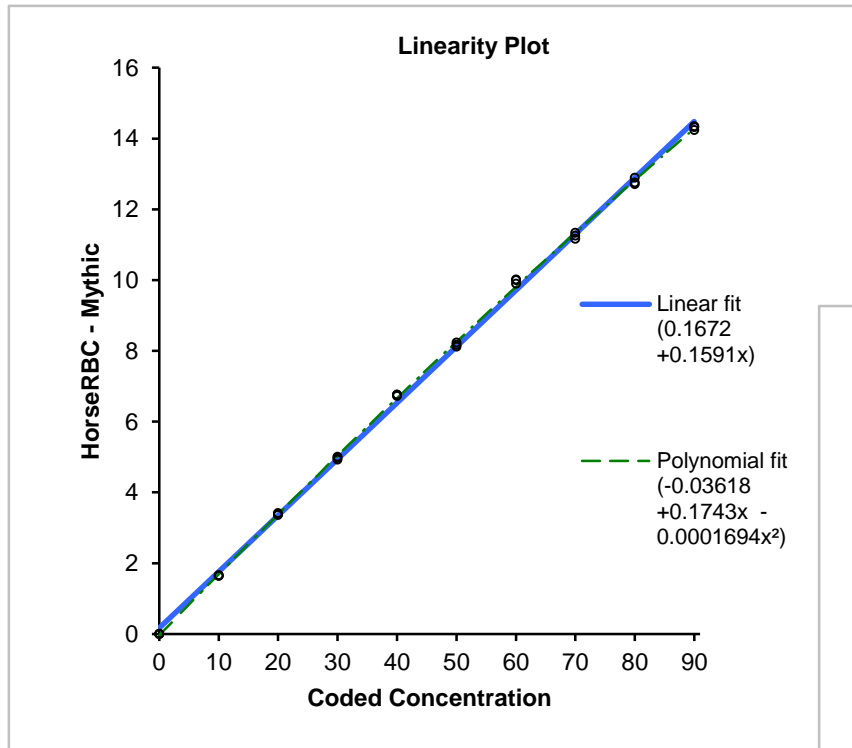
LINEARITY: Dog



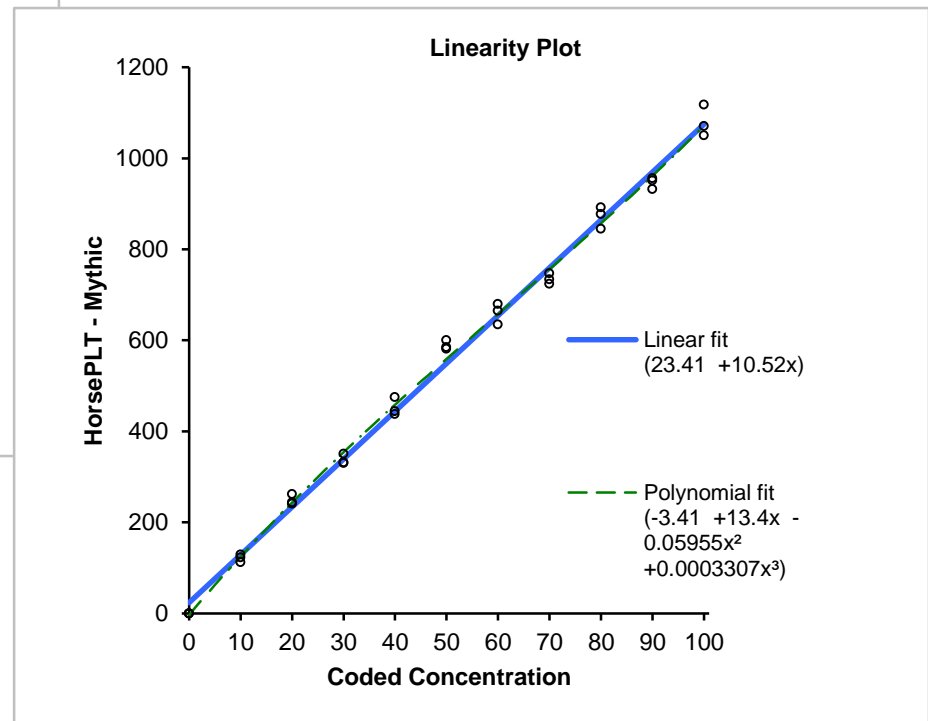
WBC: 95.000
RBC: >11.500.000
HGB: -24.3
HCT: -72%



LINEARITY: Horse



WBC: > 30.000
RBC: -14.000.000
HGB: >24.5
HCT: -62%
PLT: -1.070.000



CARRY OVER

Species	Parameter	Value	Carry over %	Value	Carry over %
Cat	WBC	41.100	0.24	15.900	0
	RBC	6.100.000	0.33	7.800.000	0.12
	PLT	170.000	1.76	336.000	0.6
Dog	WBC	39.100	0.26	19.600	0
	RBC	5.100.000	0.2	7.200.000	0.13
	PLT	196.000	0	298.000	0
Horse	WBC	14.200	0	5.300	0
	RBC	6.600.000	0.3	5.100.000	0.19
	PLT	172.000	0	146.000	0

CELL AGING

Parameter	1 h	2 h	4 h	6 h	8 h	10 h	24 h	32 h	48 h
WBC							Horse* ↓		
RBC							Dog* ↓		
HCT									Cat* ↑
MCV							Dog* ↑ Cat* ↑		
MCH									Dog* ↑
MCHC						Cat* ↓		Horse* ↓	

CONCLUSION

- CBC Parameter excellent correlation
- Absolute granulocytes good in all tested species
- No Flags
- Verify the results with a blood smear



**THANK YOU
FOR YOUR
ATTENTION**