

Element Chemistry Updated Reference Intervals

Updated Reference Intervals for Element DCX™ and Element DC5X™

Recently, a study was conducted to update the canine and feline reference intervals for the 21 parameters on Antech's Comp Plus panel. The purpose was to ensure the reference intervals continue to appropriately represent the population of normal canines and felines seen in general veterinary practice.

Key features of the study

- Selection of canines and felines classified as healthy based on criteria established by experienced veterinary clinicians (lipemic, icteric and/or hemolyzed samples were excluded)
- Study population age range representative of typical veterinary patients
- Equal representation of male and female animals
- Broad representation of canine and feline breeds
- Sufficient sample size to establish reliable and robust reference interval limits

Why are these features important?

Reference intervals define the range of test results expected in approximately 95% of the population of normal animals. The population in which the intervals are established should mimic the population veterinarians encounter every day in practice. The distribution of age, breed and sex for each species are important; likewise, the total number of animals tested is critical in setting an appropriate reference interval — the larger the population tested, the more accurately the reference limits can be defined. The minimum number for accurate reference limits is 120 animals of each species.¹

Interpretation of Reference Intervals

Because reference interval limits represent expected test results in 95% of the population of normal animals, some animals (approximately 5%) will have test results outside of the reference limits. However, for most tests, the results will generally be close to the reference limits established. Conversely, for some parameters, a result within the normal reference interval could signal a problem if it differs substantially from the patient's previous results. Therefore, patient results should be compared not only with the established population-based reference intervals but also with the patient's own previous results.

Evaluating patient results against established reference intervals, while also considering trends in the individual's own data over time, offers the most informative diagnostic approach.

Reference Interval Study Results

Study population: 445 canines; 168 felines

- Sample type: Lithium heparin plasma

SPECIES	TOTAL NUMBER OF PARTICIPANTS	MALE	FEMALE	UNRECORDED	NUMBER OF BREEDS
Canine	445	217	221	7	57
Feline	168	78	88	2	11

SPECIES	AGE RANGE	JUVENILES <1 YEAR	ADULT 1-8 YEARS	SENIOR >8 YEARS	AGE NOT RECORDED
Canine	3 months – 17 years	15	252	177	1
Feline	4 months – 20 years	6	99	61	2

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Canine

PARAMETER	UNITS	CURRENT	UPDATED
Albumin	g/dL	2.5–4.0	2.7–4.1
ALP	U/L	0–140	0–229
ALT	U/L	0–120	0–153
Amylase	U/L	100–1500	0–1478
AST	U/L	0–60	0–53
BUN	mg/dL	9–29	10.0–33.0
Calcium	mg/dL	9.0–12.2	9.1–11.9
Chloride	mEq/L	102–120	103–121
Cholesterol	mg/dL	120–310	145–402
Creatinine	mg/dL	0.4–1.4	0.5–1.4
GGT	U/L	0–14	0–13
Globulin*	g/dL	N/A	2.4–4.1
Glucose	mg/dL	75–125	69–148
Lipase	U/L	0–225	0–320
Magnesium	mg/dL	1.5–2.4	1.6–2.5
Phosphorus	mg/dL	1.9–5.0	2.3–5.8
Potassium	mEq/L	3.8–5.3	3.4–5.0
Sodium	mEq/L	141–152	145–155
Total Bilirubin	mg/dL	0.0–0.5	0.0–0.8
Total Protein	g/dL	5.5–7.6	5.4–7.6
Triglycerides	mg/dL	30–130	19–170

*Globulin is a calculated parameter; the Reference Interval set is based on Total Protein and Albumin determined Reference Intervals.

Feline

PARAMETER	UNITS	CURRENT	UPDATED
Albumin	g/dL	2.3–3.5	2.4–3.4
ALP	U/L	0–90	0–63
ALT	U/L	0–100	0–108
Amylase	U/L	100–1500	0–1586
AST	U/L	0–50	0–56
BUN	mg/dL	15–32	18.9–36.0
Calcium	mg/dL	8.8–11.9	8.8–11.4
Chloride	mEq/L	107–125	106–124
Cholesterol	mg/dL	70–200	83–305
Creatinine	mg/dL	0.8–1.8	0.6–2.2
GGT	U/L	0–10	0–10
Globulin*	g/dL	N/A	3.2–5.4
Glucose	mg/dL	70–130	82–173
Lipase	U/L	0–60	0–31
Magnesium	mg/dL	1.8–2.7	1.8–2.6
Phosphorus	mg/dL	2.6–6.0	2.8–6.7
Potassium	mEq/L	3.4–5.3	3.1–4.7
Sodium	mEq/L	147–156	152–161
Total Bilirubin	mg/dL	0.0–0.5	0.0–0.5
Total Protein	g/dL	6.0–8.0	5.8–8.7
Triglycerides	mg/dL	15–105	12–117

*Globulin is a calculated parameter; the Reference Interval set is based on Total Protein and Albumin determined Reference Intervals.

REFERENCES

1. CLSI Document C28-A2. How to define and determine reference intervals in the clinical laboratory; Approved guideline—second edition. CLSI, 940 West Valley Road, Suite1400, Wayne, PA 19087-1898 USA, 2000.