Fructosamine

- Updated Method and Reporting Ranges

The way we measure fructosamine has changed

Laboratory methodology for fructosamine measurement has recently been updated in line with best practices. Fructosamine measurement is highly sensitive to test methodology and not comparable with previously used methods or with other laboratories.

Fructosamine reference intervals have been updated

Updated reference intervals were determined from non-diabetic, normoglycaemic client-owned dogs using the new testing methodology*.

It is critical to note that laboratory-specific reference intervals may differ substantially from those provided by other laboratories or published values using different methodology. Using laboratory specific ranges derived from our own patient population allows the most accurate estimate of expected fructosamine levels in non-diabetic animals.

On behalf of the Gribbles team we sincerely appreciate your support and understanding, and we urge you to continue to support Australian-owned and operated businesses, such as Gribbles, during this challenging time.

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Gribbles Veterinary PATHOLOGY

Test interpretation

Causes of elevated fructosamine include:

- Persistent hyperglycaemia over the last 10 days to 3 weeks
  - Previously undiagnosed diabetic dogs and cats have returned fructosamine values between 312 -516 umol/L and 261 - 611 umol/L using the new methodology
  - Non-diabetic animals will usually have normal fructosamine values. Rarely, sick or stressed non-diabetic animals with persistent stress hyperglycemia may show mildly elevated values
- Elevated serum proteins
  - Fructosamine measures a range of glycosylated serum proteins. Elevation in serum proteins may therefore lead to elevated fructosamine values independently of glycaemic control
  - Hypothyroid dogs with reduced protein turnover may have elevated fructosamine
  - Marked hyperglobulinaemia may lead to elevated fructosamine

Causes of reduced fructosamine include:

- Reduction in serum protein levels
  - Feline hyperthyroidism - mean fructosamine is lower in hyperthyroid cats due to shortened half-life of serum proteins
  - Conditions where protein turnover is increased
  - Conditions leading to reduced serum albumin or globulin (including protein-losing diseases and liver failure)
- Persistent hypoglycaemia (usually due to insulinoma). Note fructosamine is not a specific test for insulinoma, which is best diagnosed using concurrent serum glucose and insulin during a period of confirmed hypoglycaemia

Diabetes mellitus monitoring

Effective monitoring of diabetes mellitus requires a combination of clinical observation (resolving PU/PD, normalizing body weight), testing for glycosuria, and glucose curves. Monitoring long term glycaemic control using fructosamine relies on comparison with previous patient values using the same test methodology to establish a trend of increasing, decreasing or stable fructosamine rather than absolute values.

Published reference intervals for “good”, “fair” and “poor” glycaemic control are based on alternative test methodology, are specific to the laboratory used to derive those ranges, and should not be used with other assays (e.g. Nelson and Couto 5th ed Small Animal Internal Medicine). General principles suggest that fructosamine within the upper end or slightly above the reference range may be “good”, values moderately above the range may be “fair”, and values well above the range may be “poor”. Values persistently in the lower end or below the range may be seen with periods of significant hypoglycaemia. Ultimately the trend of increasing or decreasing values over time is of more value when monitoring glycaemic control.

**Siemens reagent, ADVIA Centaur XP, n=116 dogs and n=90 cats, Clayton laboratory*

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